The Builder.

Vol. LII. No. 2308.

Saturday, April 30, 1887.

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Architecture at the Royal Academy.

THE show of architectural drawings this year is a very good one, better if anything than last year's, which was also an improvement on the collections of several preceding years. A high standard seems to have been maintained in the selection; there is a certain amount of unoccupied space in the upper part of the walls, but no drawings on the usual scale of architectural drawings could have been seen if hung on these upper levels; and though one must sympathise with those (we suspect not a few) who have been disappointed by the return of respectably-executed drawings, illustrating no doubt in many cases buildings which had been carried out with care and in a manner suitable for their purpose and with satisfaction to their owners, we cannot think that the Academy are wrong in restricting the exhibits, as has evidently been their intention, to such drawings as illustrate something of what may rightly be called the poetry of architecture, and of architectural drawing, which also has its poetry and its prose. The Architectural Room at the Royal Academy is not to be regarded as a kind of Building Exhibition, where a representation of a building is to be hung up merely because it is an executed work which has cost a good deal of money, and brought a respectable percentage to the contractor and a more modest one to the architect. The object of an architectural room at the Academy is to illustrate architecture as an art,—as the art of giving to buildings picturesque and expressive character, and rendering them objects of beauty and delight as well as of utility. In any other view architectural drawings have no *locus standi* at an Academy of Arts,—a fact which has certainly been forgotten in some previous years, when drawings have been hung representing great blocks of building, the sole interest in which may be said to have been a matter of five per cent. As it is, there are really very few drawings in the room which have not some picturesque interest and character. There is far less of the mere street house element than there used to be; there is a great deal of variety in the style and feeling, and in the methods of execution of the designs and drawings; and the praises which an eminent French architect has recently, in the pages of a French journal, lavished on the English architecture of the day in respect of its picturesque qualities, may be fairly said to be borne out by the very typical collection in the Architectural Room at Burlington House.

One other comment is suggested by a general look at the drawings; viz., that the Queen Anne heresy in its cruder form seems to be dying out. Some little time ago the rooms used to be full of "Houses in —— Place," all exceedingly like each other, all showing the same bald repetition of brick quoins and cannon-ball finials. There may have been more of these sent in than we can conjecture, but if so, few of them have found favour in the eyes of an enlightened Hanging Committee. There are designs which are, no doubt, developments of Queen Anne, but then they are really developments, and have left the cruder stage behind. It may also be noted that there is distinctly more evidence of a leaning to Gothic feeling and taste than we have seen of late years; in this case also not that mere imitation (generally) of Gothic styles which was in favour a good many years ago, but an inventive architecture which uses the old materials after a new fashion; and while the collection is thus of considerable interest to those who study architecture with some knowledge of the subject, the variety and effective character of many of the drawings, considered merely as drawings, and the number of different methods of delineation employed, ought to render the Architectural Room more interesting, even considered merely as an additional "picture room" to the public generally, than it has commonly been considered. Of late years, indeed, we have discovered a certain awakening of interest on the part of the public in the architectural drawings; the room devoted to them is not such an entire solitude as it was wont to be; and it must be said that a good many of the architectural exhibitors are going in the right way, by the fine character of their drawings, to encourage this laudable increase of interest on the part of the general body of visitors to the Academy.

The central positions on two of the walls are occupied by the diploma drawings of two Academicians,—Mr. Pearson's perspective view of Truro Cathedral from the north east (1,631), a highly-finished pen-and-ink drawing, and Mr. Waterhouse's view of "Manchester Town-hall" (1,680), a large water-colour drawing in an effective though somewhat loaded style. The architects do not, it would appear, like the painters, put off their least valuable works on their brethren as diploma deposits. Each of these diploma drawings is very carefully executed, and each shows its author at his best in his own special qualities of architectural design. The Manchester Town-hall is, of course, a pretty old building now, but Mr. Waterhouse made a good choice in presenting a drawing of it as his diploma work. It is not only one of the most important and best-known of his works; it is of all others, perhaps, the most typical of his method of treating Gothic materials. It is a pity that the plan was not added, for the plan was a remarkably successful one, dealing with a very complicated problem or puzzle in planning; and we may here observe that the absence of any plan of the various buildings illustrated is even more conspicuous than it was last year. Our wish to see more plans of buildings appended to the drawings is by no means at variance with the opinion expressed just now that architectural art, as distinguished from mere building, is the proper element for an Academy Exhibition; for plan is the basis of design; and without the plan it is impossible to understand rightly the meaning of the design, or the manner in which the architect has succeeded in rendering what might have been a mere utilitarian erection a thing of beauty and interest. There is no need that the plan should be large enough to make an extra drawing, or to be a disfigurement to the perspective drawing: a plan to a small scale would suffice to explain all the architectural qualities of the building; and if the Academy, instead of tacitly encouraging architects to ignore plans in their exhibits, would issue an edict that all drawings (except those which are only picturesque illustrations of remains of ancient architecture) should have appended to them a small-scale plan, they would be greatly increasing the interest of the exhibition to architects and architectural students, and they might even in time teach the public something about the relation between plan and design, about which the said public know at present absolutely nothing.

The perspective view of Truro Cathedral shows Mr. Pearson, we have observed, at his best, though that remark must be taken with a certain kind of reservation. It exhibits him as the most complete master of reproduced Gothic architecture since the death of Scott. The drawing shows an early thirteenth-century cathedral, recalling Lincoln more than any other cathedral in most of its details, except in the treatment of the termination of the tower; a picturesque group, with an octagonal chapter-house, rising above the roofs of some low houses which form a foreground to the picture. The drawing is finished with great care, and in this respect is a rather wholesome practical protest against the somewhat too rough and "dashing" style of architectural pen-and-ink which is in vogue with some draughtsmen. But there is not a new thought in the design; it is simply a Mediæval cathedral over again. Some years since, when the geometrical drawings for it were exhibited here, we expressed our regret that with such a splendid opportunity as the building of a large modern cathedral *ab initio*, there had been no attempt made to produce, if a Gothic cathedral, at least some kind of development of that type, both in plan and design, suited to the requirements and feeling of the present day. Other smaller churches by Mr. Pearson have left no doubt of his capability and of his willingness to do this when called upon; we must presume, therefore, that a pure Mediæval cathedral was the result wished and asked for; but the most learned reproduction of a Mediæval building cannot rank with original thought and design, and therefore we say that Mr. Pearson is really at his best in some of his smaller churches, rather than in this mere resuscitation of the architecture of the past.

Another of the important drawings occupying a central place in the hanging is that representing the interior of "The Queen's Hall of the People's Palace for East London" (1,679), by Mr. E. R. Robson. This shows a large hall with an elliptical ceiling covered, on the broad ribs which mark the bays, as well as on the interspaces, with very elaborate panelling and ornament. Each rib springs from a cornice projection carried by two Corinthian columns, the shafts fluted for one quarter of their length below the capital; the architrave breaks over each column, except the corona and upper moulding, which are carried unbroken across the two columns; between each couple of columns is a statue. The columns rise from the level of a gallery about one-third the height of the room, carried on Caryatides standing free on the floor with a small subsidiary column behind each. The lower portion of the wall under the gallery is plainly treated; the gallery has a front projecting in a series of slight curves from bay to bay, with cantilevers under. The effect of the whole is dignified and rich; the weak point is the treatment of the upper portion of the end wall, which is panelled in large square and circular panels in a manner which looks rather bare and bald as contrasted with the richness of the remainder. The drawing, in pen-and-ink line without shading, is an admirable piece of careful and painstaking draughtsmanship, of which we will give a reproduction in a week or two.

Another large drawing is "Charity: a Design for a Stained-glass Window, Philadelphia" (1,733), by Mr. H. Holiday. This is merely a carefully-executed red crayon cartoon, not, of course, giving any idea of the working of the design in glass. In the centre is a triple alcove, shown partly in perspective, the two side alcoves being at an angle with the centre; in the centre alcove stands the figure of Charity, a noble-looking fully-draped female figure; on either side two subordinate figures distribute bread and other provisions to folk on the lower level, in defiance of the Charity Organisation Society's maxims; beneath the centre is a double flight of steps and a platform, on which children are brought and laid before the goddess of Charity. The architectural background, which fills up nearly all the composition behind the figures, shows well worked-out details of Lombard character; on the top of it are reclining figures. The whole is a graceful composition, and the figures, it is almost needless to say, are admirably drawn; but a cartoon of this kind is not the best way of showing a design for stained glass; there is many a slip between the idea and the due working out of it in lead and glazing.

Shortness of time prevents our going further into the collection in detail in the present number: in future issues we will go through notes on most of the designs exhibited, taking them in the order of hanging.

Timber Drying.—We are asked to mention that the Universal Cool Air Drying Company, Limited, have opened a new dryer on the cool air system at Macclesfield-street, City-road, E.C., on the Regent's Canal, for the seasoning of every kind of timber. The premises are very large and commodious, and the dryers, specially adapted for timber already finished, are capable of treating about 1,500 squares of 1-in. boards at one operation.

CANALS, LOCKS, AND CANAL-BOATS.*

IN continuation of our remarks on the subject of water transit and the importance of putting our canals into working order for present conditions of traffic, it may be useful to add some suggestions more in detail as to the adaptation of canals and boats to present requirements. The size of boat best adapted to an improved canal navigation need not be the same for all canals, but it would be desirable that it should be so for the through routes, and that these main lines should be joined so that traffic may take any direction without change of vessel,—in the same "bottom," to use the navigation term. But the branch canals and those traversing agricultural districts, other than the main lines, would need but little alteration; perhaps none in respect of locks or bridges. A boat drawing 4 ft. of water will carry 50 tons if the length of the boat be 60 ft. and its width 14 ft., or 60 tons with the same width and a length of 70 ft. If the draught be 4 ft. 6 in., the length of the boat 75 ft., and width 14 ft., the weight carried would be 80 tons. This is the least of any of the propositions for enlargement of the present means of transit. If the boat were 110 ft. long, 11 ft. 6 in. wide, with a draught of water of 6 ft., the weight carried would be 120 tons.

As a basis for the scale on which improvements should be made, we ought to consider the opinions of those who are practically engaged in canal operations, although we ought not to be limited by those opinions in any design of improvement in water transit on a large scale; and perhaps it is only on a large scale that anything can be done at all, of any national value. However, amongst the evidence given before the Select Committee of the House of Commons on Canals in 1883 was that of Mr. Morton, a member of the firm of Fellows, Morton, & Co., railway and canal carriers, of Wolverhampton, to the effect that if the canals were adapted for a boat or barge propelled by steam, and capable of carrying 80 tons, the cost of haulage would be reduced to less than one-half of what it is now by the narrow boats carrying 30 or 40 tons. For such an improvement he thinks there is a good nucleus already in existence, and he would propose to open up that line in the first instance, viz., from London to Wolverhampton. The total distance is about 168 miles, and for 110 miles the locks will admit vessels carrying 80 tons. This leaves but 58 miles, or a little over one-third of the distance, which would require extensive alterations; and even of that 58 miles 16 consist of the Birmingham Canal, which he thinks would be wide enough in its present state.

The route here indicated by Mr. Morton from Wolverhampton to London takes the following lines:—First, the "Birmingham Canal," from Wolverhampton to Birmingham, 15 or 16 miles; then by the Warwick Canals to Napton, a distance of 37½ miles; then on a level piece of the Oxford Canal for 5 miles to Braunston; and thence by the Grand Junction Canal to the Thames near Brentford, a distance of 91 miles, and down the Thames about 15 miles, on the average, to the Pool or the Docks. But it may be said that instead of coming into the Thames at Brentford the boat might leave the main line of the Grand Junction Canal at or near Norwood, and proceed by way of Paddington into the Regent's Canal, and so on to the Thames at Limehouse, a distance of 110 miles from Braunston. Mr. E. J. Lloyd, C.E., the engineer and manager of the Warwick Canals, stated that 65 tons is the greatest cargo which can now be carried on the Grand Junction Canal; but it would appear from other evidence that the locks are long enough and wide enough for vessels of 80 tons. Mr. Lloyd proposes that between Birmingham and London the locks be made 120 ft. long, 12 ft. wide, with a depth of water on the sills of 7 ft., and that the vessels be 110 ft. long, 11 ft. 6 in. wide, and drawing 6 ft. of water, carrying 120 tons. As an instance of a through route upon which he would adopt these dimensions he mentioned to the committee the route between Liverpool and London. Starting from the Thames at Limehouse, with a vessel of 80 tons, the following would be the experience of the present canals, taking the shortest of three possible routes. First, by the Regent's Canal to Paddington, nine miles, and by the Paddington branch, thirteen miles, to the main line of the Grand Junction Canal, where the cargo would have to be reduced to 65 tons, in order to pass along that canal to Braunston, a distance of eighty-eight miles. Here the boat would enter and pass along the Oxford Canal, and the cargo would be further reduced to 30 tons, and carried in a boat 72 ft. long, 7 ft. wide, and drawing 3 ft. 6 in. depth of water, in order to enter the Warwick Canal at Napton, five miles from Braunston. From Napton the same cargo would be carried to Warwick, fifteen miles, and to Birmingham, a further distance of twenty-two miles, where it would enter and pass along the Birmingham Canal for fifteen miles to the Staffordshire and Worcestershire Canal, along which it would pass for one mile and a quarter, and then enter the Shropshire Union Canal, which would carry it to Ellesmere Port, a distance of sixty-eight miles. But it may be observed that after proceeding along the Shropshire Union Canal for about one-third of that distance of sixty-eight miles, the locks become larger, and the cargo might be put into larger boats. We will say, however, that the narrow boat continues on to Ellesmere Port; the cargo is then transshipped into a larger vessel, in order to navigate the estuary of the Mersey, ten miles, to Liverpool; for the narrow boats which alone can pass through the canals mentioned could not safely reach Liverpool through the estuary. Thus the whole length of this route,—and we take it as being similar to many others,—is 246 miles, the separate parts of which are under the following control, viz., the Grand Junction Canal is under that of an independent company; the Oxford Canal, the same; the Warwick and Napton Canal, the same; and the Warwick and Birmingham Canal, also under an independent company; but the next length, the Birmingham Canal, is under the control of the London and North-Western Railway Company. Then, the Staffordshire and Worcestershire Canal has an independent company, but the Shropshire Union is again under the control of the London and North-Western Railway. So that in this route of 246 miles, eighty-three miles are under the control of a railway company.

The amalgamation of the independent companies for the purpose of forming an improved means of water-transit would not be difficult, but it is expected that the railway interest would throw great obstacles in the way of any such proposal. It could probably not be done at all without an Act of Parliament; and, seeing how many railway directors there are in Parliament, and how strong the general railway interest there is, it is probable that any Bill which might be introduced with the object of providing means for the amalgamation of these independent canal companies, or those of any other route on this or other line, would not pass. It might, moreover, by a possible combination with the railways, not have the effect, ultimately, of reducing the cost of transit so as to enable the manufacturers and traders of the country to compete with those of other countries where the cost is reduced, under Government control, to the lowest possible charge,—that is, to a toll sufficient only to cover the cost of maintenance of the works, both of the canals proper and the river navigations; for, in France and Belgium it is considered to be of national concern that full and free means of transit should be afforded to all alike, the consequences of which are that industries arise along these waterways and in their neighbourhood which before had no existence, and they have been the means of improving the general trade of the country. It has been often said that supply waits upon demand,—that demand creates a supply. The reverse is sometimes the case, as it is in the case of free waterways when properly connected: the supply distinctly creates a demand.

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* See article on "Water Transit," p. 593, *ante*.

There is a similarity in the two cases of French and English canals in this, that the locks there were formerly of different widths, as they are here, and in 1868 this was found to be so disadvantageous that the French Government decreed that thereafter no lock should be constructed less than 17 ft. in width with 6 ft. 7 in. depth of water on the sills. This width was adopted because it was that of some of the then existing locks. One of the witnesses examined before the Committee we have named,—Mr. F. R. Conder, C.E.,—advised that the existing locks of the Grand Junction Canal should be adopted as the general gauge for all others; they are 87 ft. 6 in. long and 15 ft. wide, and Mr. Conder would increase the present depth of water from 5 ft. to 7 ft. He finds that of the whole number of 1,901 locks in this country, 931 are 80 ft. long, or more. The locks are, on many of the canals, as a matter of original design, congregated in series at a few places, rather than, as in some other canals, one or two locks at more frequent intervals, but as an average of the whole of the canals Mr. Conder found that the mean distance apart of all the locks was 1·37 miles. The effect of these many locks is to reduce the average running speed of the boats from two miles and a quarter an hour to two miles; and if the running speed be increased to four miles and a half an hour, the locks would reduce it to an average of three and a half. It is not, however, unlikely that if main lines of canal can be improved and adapted to the present requirements of trade, locks would be superseded by inclines, and in that case the boats or barges would be of larger dimensions. This was recommended to the Committee by Sir Arthur Cotton, R.E., who would have either an incline, similar to that on the Monkland Canal, or a vertical lift, similar to that in use for transferring the boats from the river Weaver to the Grand Junction Canal. This witness stated that even in the present state of the canals there are lines which convey more than a million tons a year, and that there are several lines on which, if improved and made capable of carrying the traffic, we must be prepared for a traffic of at least five million tons. In his "Memorandum" General Cotton says:—"The first thing, of course, would be to take the line of canal out of the hands of the railway, and the next to put the whole line under one management; and I have no doubt, myself, that it should be taken into the hands of Government and put under a Commission, like the Weaver Navigation in Cheshire. The locks should then be enlarged and put into a far more effective state than at present,—that is, be so constructed as easily to pass a boat in three minutes at most."

In order to enable a speed of six miles an hour to be accomplished the canal would have to be 65 ft. wide at the top and 7 ft. deep, if the boats were 12 ft. wide with 6 ft. draught of water. Mr. E. J. Lloyd, C.E., stated that he had no doubt the line of canal we have named could be purchased and improved to the extent he advised for from 10,000*l*. to 12,000*l*. a mile. Estimates made by other engineers were 12,000*l*. and 15,000*l*. a mile for the purchase of existing canals and their enlargement and general improvement. Sir Arthur Cotton adopts this latter amount, and shows that with the large traffic which cheap transit would produce the cost of transit would be but a small fraction of a penny per ton per mile.

The Report of the French Commission in 1872 was that owing to the facility with which the less costly plant of canals can be increased, as compared with railways, and the ease with which boats can be stopped anywhere, water carriage possesses special advantages. The dimensions of the locks there recommended are 138 ft. long and 17 ft. wide, with a depth of water on the sills of 6 ft. 7 in., which would pass vessels of 300 tons. At the last meeting of the British Association, and also at the Birmingham Chamber of Commerce, Mr. Sampson Lloyd, of Birmingham, brought forward this subject, and in a pamphlet subsequently published, entitled "National Canal" (Cornish, Birmingham; and Simpkin & Marshall, London), he proposes that the locks should admit sailing vessels of at least 250 tons and steamers of 400 tons, joining the navigations of the Thames and the Mersey by one line and the Severn and the Humber by another. The utility of the existing canals would be increased by these means, inasmuch as they would act as feeders of traffic to the National Canal, and would be fed with traffic by it. He enters into the financial question of how the expenses of so great a work are to be met, and suggests that if his scheme be investigated it will be found that it is safe from a monetary point of view, and likewise would be nationally beneficial, so that it should commend itself to the favourable consideration of all.

It would be unreasonable and hopeless to expect that the initiative of a national work, such as this would be, should be taken by persons of any locality, or of any particular interest; but we have endeavoured to give some idea of the variety in the *scale* of the proposed work indicated by different persons as their view of what it ought to be. First, we have the canal carrier, boat-owner, and general trader in that line of business; he looks to small measures for improving the present locks and line of canal; and the canal engineer and manager wants a larger vessel, and that the earthen slopes of the canal cuttings shall, near the top, be protected by dwarf walling,—a comparatively inexpensive proceeding, but one which present canal companies refuse to sanction, because the traffic is languishing. Then the independent engineer,—that is, one not immediately connected with canal management under a company,—looks more boldly at the situation of affairs, and recommends an enlarged scheme; then, the largest scheme of all, with a suggestion as to how the financial question is to be met. But whatever the scale recommended by these several authorities, they are all agreed upon one point, that the canals and portions of through routes which have been obtained by railway companies, either by purchase or by lease, or by an arrangement with the canal company for the management of one kind of traffic on the canal,—that this control shall cease, as the first step. Wherever we turn in this question of inland water transit the possession of some portions of the canals by railway companies seems to have a paralysing effect upon the whole system. Another thing upon which all the witnesses before the Committee we have named seem to be agreed,—except such opponents of the improvement of canals as Mr. Bolton, the Chairman of the Caledonian Railway Company, who, by the bye, was not a witness but a member of the Committee,—is that there would, unquestionably, be a large increase of traffic on canals if better means of transit were afforded. They refer chiefly to manufactured goods and to minerals, but we would point out that the agricultural districts cannot be wholly left out of consideration, for they have been to a considerable extent robbed of their previous means of carriage of marketable produce by the substitution of railway stations at wide intervals for the more numerous and convenient canal wharfs. If it be asked why, with all these advantages, there is no greater traffic on canals, the answer is, that under present circumstances no local canal authority,—unless it be in a few exceptional situations such as those of the Aire and Calder, and perhaps the Gloucester and Birmingham Navigations,—will make a beginning of the general improvement which is desirable, for the reasons we have indicated, and which should be taken up comprehensively.

Dundee.—A meeting of the committee appointed to promote the movement to establish a Victoria Art Gallery in Dundee, in commemoration of her Majesty's Jubilee, was held the other day. It was reported that of the 12,000*l*. or 13,000*l*. required, between 5,000*l*. and 6,000*l*. had already been promised, and it was resolved to issue a circular inviting further subscriptions. It is expected that the foundation-stone of the gallery will be laid on Jubilee Day.

NOTES.

FROM a letter of the Manchester correspondent of the *Times* of Thursday, it appears that 2,500,000*l*. of the capital of 3,000,000*l*. which was to be raised in Lancashire and the neighbouring counties for the Manchester Canal scheme, by a given date, has been subscribed; so that the prospects of the canal are looking better than could have been expected a little while since. Whether the remaining half million will "come up to time" remains to be seen. The *Times* correspondent admits that great pressure has been brought to bear to raise the money, and that the investment in the scheme has been urged in many quarters rather as a moral duty than as a prudent venture. If it be so, we make no criticism on such a state of feeling. On the contrary, it is rather refreshing to think of the financial world being for once inspired by an idea, and willing to risk a good deal for glory. But let it be not forgotten that it is a risk. Money invested as a moral duty brings a return in the next world, let us hope, but it is apt to be recusant in regard to this world.

AT a meeting of the Hellenic Society, on April 21st, Professor Percy Gardner read a paper by Mr. W. R. Paton on his recent discoveries at Assarlik. Mr. Paton was himself unable to be present. The tombs opened are upon a ridge facing the Acropolis to the south-east. Mr. Paton thinks that he has lighted upon some of those "burying-places of the Leleges" mentioned by Strabo (vii., c. vii., 2), as still existing in his time in Caria, together with certain "deserted fortresses." The paper read gave a detailed account of the structure of the tombs, and woodcuts were shown giving sections of two examples, and also specimens of pottery discovered. From these it is clear that, whoever the people were who made the tombs, they were still in the "geometric" stage; the weapons found are iron exclusively, and the bodies of the dead appear to have been in all cases burnt. The impressed patterns found on sarcophagi are closely analogous to similar patterns found at Corneto. Altogether Mr. Paton's find promises to add important links to the ethnic chain between Asia Minor and the early Italian settlements. Mr. Walter Leaf read a paper on a disputed Homeric passage, and afterwards showed photographs taken by himself of a prehistoric house lately discovered at Tiryns, of which no report has yet appeared, and which promises to be of considerable importance.

THE study of geographical science loses a warm promoter by the death of the late Mr. James Wyld. Amongst his varied labours in that direction was the building, in 1851, of the great Model of the Earth within the enclosure of Leicester-square. This quarter of the town, indeed, has been a favourite centre for exhibitions of a similar character: such as the Leverian Museum at Leicester House; Robert Barker's, subsequently the Burfords', Panorama, the first of its kind; the Mississippi River Diorama at Savile House; the Panopticon on the site of the Alhambra; and so on. Mr. Wyld obtained a ten years' lease of the ground for 3,000*l*., and erected, after Mr. H. R. Abraham's design, a circular structure 90 ft. in diameter and lighted through the dome ceiling, somewhat after the fashion of the Pantheon. The plaster model of the earth, on a scale of ten miles to an inch, was fitted on to the inside of a globe which measured 60 ft. across. Amongst the minor exhibits we call to mind some highly popular models of siege operations illustrating the Crimean war. On the demolition of the "Great Globe," about twenty-five years ago, the enclosure was suffered to fall into a state of squalor and neglect that rendered it a standing reproach, and a constant theme for banter in the comic press. The chief object of attack was the exhumed leaden statue of King George I., which, after undergoing successive mutilations, was finally besmeared with red, black, and white paints. Having been originally modelled by C. Buchard for James Brydges, first Duke of Chandos, it had been bought by the inhabitants of the square in the famous sale at Canons (1747), and on more than one occasion was deemed worthy of a coating of gilding.

THE Topographical Society of London and the Society for the Protection of Ancient Buildings are surely asleep. Certain statements that have recently appeared in the daily press go to show how great a misapprehension obtains in respect of the *ci-devant* Western Exchange, by Piccadilly. In one paper we find it described as the work of Inigo Jones, thus carrying us back to the days of the Conduit Mead and Brook-shott Fields, as watered by the Aye Bourne, when Piccadilly itself was unknown by that name so far westwards, and to before the time when Queensbury, Clarendon, and Berkeley Houses stood on open ground. In others it is appropriated for the one scene of nearly all the past chronicles of Old Bond-street. Lying between that street and Samuel Ware's Burlington Arcade (1819), it was erected, we are authoritatively informed, within the current century, over the yard of the Red Horse Tavern. A pewter pot bearing that name was found during the alterations now in progress. It was designed as a kind of bazaar or appanage to the Arcade, with which it communicated by a doorway that has been blocked up for years past. The upper floor consisted of a range of wide galleries, supported by plain deal squared posts; the whole being lighted from above. Having been wrecked by the great storm of forty years ago, it was then taken over by its recent occupiers, Messrs. Holland & Sherry, woollen cloth workers and dealers. That firm converted the galleries into offices and side rooms, but did not alter the main character of the structure. They lately let the premises to Messrs. Morgan & Co., of Long-acre, whose architect, Mr. Wheeler, is rebuilding No. 10, Old Bond-street, and is rehabilitating the Exchange at the back thereof. The posts have been capped in gilt, and ornamentally encased; the galleries thrown open again (their original railing being retained), and some light, tasteful decoration is added to the woodwork. Under "Bond-street," in his "Curiosities of London," (1855), Timbs mentions a large billiard-room at No. 10 as painted, 1850, in encaustic by E. F. Lambert, with panels bordered with arabesques. We are assured that this description does not apply to the premises under review. Messrs. Holland & Sherry have removed to new premises in Warwick-street, where the former feature of a large hall with galleries around has been reproduced. The buildings cleared away included some notorious tenements along the western side of Lower John-street, together with Golden-place (in that street) and the King of Prussia public-house. The northern portion stands on the site of the house, at the south-western angle of Golden-square, which had been identified with that which was fixed upon by Charles Dickens as the home of Ralph Nickleby. Some relics of the old house have been carefully preserved by the present proprietors.

WE learn from the *Scotsman* that Dr. Rowand Anderson has received instructions to proceed with the drawings for the Hall of the Edinburgh University, the cost of which is to be defrayed by Mr. McEwan, M.P. The dome of the old University buildings is now completed, with the exception of a figure of Youth bearing the torch of Knowledge, which is to form the culminating feature of the lantern, and for which a commission has been given to Mr. John Hutchison, R.S.A., but it will be some months before it is ready to be placed in position. Dr. Rowand Anderson has departed from the original design by Adam,—which was intended to be of smaller dimensions, and entirely constructed of timber and lead,—the lower stages of the dome now erected being formed of stone, and the roof only of lead upon timber. As seen from many points of view, the dome forms an important element in the sky-line of the buildings, but it cannot be seen from some places, such as the Meadows, from which it was expected by many to point out the *locus* of the University; and even from the west end of Chambers-street the lantern only appears over the roof of the Museum of Science and Art. The chamber within the dome it is proposed to appropriate to the Professor of Fine Arts, and here is to be placed a bust of Mr. Robert Cox, who left the bequest from which the dome has been erected.

FOLLOWING the popular precedents of "Old London" and "Old Edinburgh," a notable feature of the forthcoming Royal Mining, Engineering, and Industrial Exhibition on the Town Moor, Newcastle, will be a reproduction of the old bridge across the Tyne. Having stood for more than 500 years, that bridge was destroyed by a flood in 1771. It was largely constructed from out of the ruins of an earlier structure which had replaced the bridge of Hadrian (A.D. 120). Having a tower and portcullis at each end, it was, like old London Bridge, crowded with houses. It had also a central stronghold, together with a chapel dedicated to the Virgin. Here, according to Lanercost's "Chronicle," was exposed the right-side quarter of William Wallace. In later times the remains of an Earl of Northumberland and of other worthies were similarly displayed. Some authentic representations exist to serve as a pattern for this bit of old Newcastle-on-Tyne. The model, being about 110 yards long, and carried upon nine or ten piers, rising 20 ft. above the water-line, will be thrown across a lake in the Elswick Grounds, recently bought and enclosed by the Corporation. It is expected that the cost of construction, some 3,000*l.*, will be recouped by the letting of shops to be opened on the bridge itself. The existing hydraulic swing bridge was opened in 1876.

IF the Institute of Painters in Water-Colours would hang three hundred works in their centre room, instead of hanging more than a thousand over the walls of their three large rooms, they could make a much better and more high-class exhibition. As it is, there are three rooms containing a quantity of mediocre works, and a good many that are less than mediocre, from among which the minority that possess force and originality have to be painfully picked out. Sir James Linton has an effective and beautifully-executed work, "My Tableau of 1885" (609), representing the Emperor Maximilian visiting the studio of Albrecht Dürer; but judging from the architectural character of the room and the dimensions of the one small window shown, it is not very apparent where Dürer gets the light for his work. Among other figure subjects may be mentioned "Little Dorrit's Visit to her Sister at the Theatre" (625), by Mr. C. Green; the face of the little heroine is a very refined and pathetic study; Mr. Henry Stock's "Love's first Dart" (35), one of his ideal fancies, pretty in sentiment and fine in colour; his other one, "Musician invoking a Sea Nymph" (602), is spoiled by the ugly figure of the man; Mr. Dodd's "The Inglorious Arts of Peace" (469), some military men engaged in cooking, is a brilliantly-painted interior, with figures very well drawn and studied,—there is a want of point in the subject. This objection cannot be urged against Mr. Joseph Nash's "The Miser's End" (808), a tragic scene enough of the interior of the miser's room, with a cold dawn breaking in, papers strewn about the floor, and the chair and its deceased occupant overthrown; the idea is perhaps a little stagey, but the picture is effective and striking. Mr. Walter Langley's "Betrayed" (974), a village scene in which the central figure is a woman who walks down the street and is the gaze of the villagers, is a drawing with a subject, rather deficient in the detailed treatment of the figures. Mr. Hugh Carter, in his "Scene from the Legend of Montrose" (884), is taking up a new type of subject; the figures are rather wanting in force both of execution and expression; his peculiar style is better suited to the subjects from rustic life which he has hitherto painted. One of the finest works there is a picture illustrating the pathos of animal life: an old white horse has fallen over, dying, after tugging the plough to "The Top of the Hill" (161), his companion looking down on him with that dull puzzled sympathy which an animal sometimes shows towards another in distress. Mr. Walter Severn has been making another of his brilliant experiments, "Sunlight on Clouds and Sea" (243), very real in parts, but, alas! what can white paper do with the dazzling glitter on the water, between the eye and the sun? There are several of Mr. Knight's highly-elaborated, but rather cold and mechanical, landscapes: some very fine works in a higher artistic key, by Mr. Cotman, "Moston Church" (235), "Cley Church, Norfolk" (429), very fine and broad in style. Among other landscapes may specially be mentioned, "A Rainy Day" (408) and "A New Neighbourhood" (72), by Mr. Alfred East; "Setley Heath" (174), by Mr. Wimperis; "A Windy Day on the Moor" (188), by Mr. R. Carrick; "Going to Fold" (527), by Mr. Edwin Bale; "A Shepherd and his Sheep" (573), by Mr. G. F. Wetherbee; "A Sandy Bay" (791), by Mr. C. E. Holloway; "Passing Showers" (114), by Mr. W. A. Ingram. All these are landscapes with true feeling for nature in them, contrasting with such a piece of hard-mannered mechanism as Mr. Fahey's large "Sunset, Martham Broads" (899), the sort of thing which gets an honoured place at the Institute. Mr. Napier Hemy seems to have a new kind of sea, which is not at all equal to his old ones. Among works specially architectural are a fine drawing by Mr. Fulleylove, "An Italian Garden" (681), not possessing, however, the force and depth of colour of some of his works; a Spanish Patio (468), by Mr. Macquoid; Mr. Cyrus Johnson's "Stratton, Cornwall" (254); Mr. R. Barratt's "Library Door, Siena Cathedral" (536), and Mr. R. Dudley's "Fountain of Charles V. at the Alhambra" (32), a very nice bit of architectural representation.

THE Metropolitan Board of Works have adopted a recommendation of the Bridges Committee, based on a report of Mr. Baker, that Lambeth Bridge should be extended and repaired, and the wire cables anchored in the new work, at a cost of 4,000*l.* It was stated in connexion with the report that "the bridge as originally designed was of less strength than was required as a public and not a toll-paying bridge." Thus it will be observed that the abolition of tolls on bridges sometimes involves questions other than those of financial policy merely.

IT is stated that an American gentleman has secured Mr. Herbert's original painting for the fresco in the House of Lords of "Moses bringing down the Tables of the Law from Mount Sinai," and that the artist has been commissioned by the same gentleman to finish the series originally contemplated for the House of Lords, "The Judgment of Daniel," "The Judgment of Solomon," and "The Sermon on the Mount." These paintings, it is understood, are to form "the nucleus of an art college" in the United States. Admirers of the artist's recently exhibited works on the walls of the Royal Academy will, no doubt, realise what an artistic benefit is thus about to be conferred on the fortunate but as yet unnamed locality in the United States.

SOME NORFOLK FONTS.

Amongst the many fine fonts to be found in Norfolk, some of the finest are those in the north-west portion of the county. Although the subjects carved on them are usually the same, yet there are probably not two exactly alike in composition. They thus afford examples of the versatility of the Mediæval designer, even when his stock of subjects was necessarily somewhat limited. On the richer fonts the bowl is generally ornamented with groups of figure sculpture,—often the Seven Sacraments and the Crucifixion. Others have seated figures, while the plainer kind usually have either traceried panels, the emblems of the Evangelists, shields with emblems of the Passion, or other simpler modes of decoration. Colour has also been largely used,—blue, red, and green remaining on the ground-work of the sculptured panels in many cases. The number of steps varies from three downwards, and there are many examples that have lost their steps altogether. Undoubtedly the finest example of a Perpendicular font in Norfolk, — and perhaps in England, — is that at Walsingham.* The font itself is octagonal in form, with an ogee-headed niche on each face of the bowl containing the Seven Sacraments and the Crucifixion. (It may be here noted that in most cases the Crucifixion occupies the side facing west). At the angles are pinnacles which were once supported by angels, now destroyed, while above the niches is a cresting, and below them an embattled moulding. A single patera occupies the space between the angels in the large hollow moulding of the lower part of the bowl. The stem is richly ornamented with niches, having four seated and four standing figures (the latter with scrolls), and at the angles smaller niches, on the pedestals of which stand angels. The plinth is bold and plain, but relieved by pateræ on four faces, and on the other four broken by the intersection of the figure pedestals. The steps, three in number, have their risers richly panelled with quatrefoils and other tracery, the upper step being in the form of a Maltese cross. The height of the font is 3 ft. 9½ in., the diameter of the bowl 2 ft. 6 in., and the height of the steps 3 ft., giving it a total height from the ground of nearly 7 ft.

Not far from Walsingham is East Dereham, which possesses another fine font. As at Walsingham, the Seven Sacraments and Crucifixion occupy the eight sides of the bowl. Instead of pinnacles at the angles, however, are small niches, containing figures of seraphim. These niches are supported by ribs which rise from columns at the angles of the stem. Arches are thrown across underneath the carved panels, and below are angels, with hands together, in the attitude of prayer. The stem has a single standing figure, under a vaulted niche (the canopies are broken away), and below, round the plinth, are seated figures in cowls, and three out of the four of the evangelistic symbols. The winged bull of St. Luke is not, for some reason, given, and the angle shaft of the stem merely finishes with a base mitreing on the plinth in the usual way. The great height of this font, 4 ft. 9 in., necessitated a raised step for the officiating priest. This is placed on the west side, and consists of an oblong block, 2 ft. by 1 ft. 6 in., and 1 ft. 4 in. above the upper step. There are two steps, the upper one panelled with quatrefoils, and the lower one plain.

Other examples of a similar kind occur at Walsoken (fig. 1), which has shields bearing the emblems of the Passion at the angles of the plinth; Binham Abbey, where the Crucifixion is not given on the west front of the bowl, but some other group now too much worn to be made out; Cley, now much worn, and plainer in character; South Creake, an example approaching that at East Dereham in general arrangement, but without seated figures round the plinth, and retaining considerable remains of colour; and others.

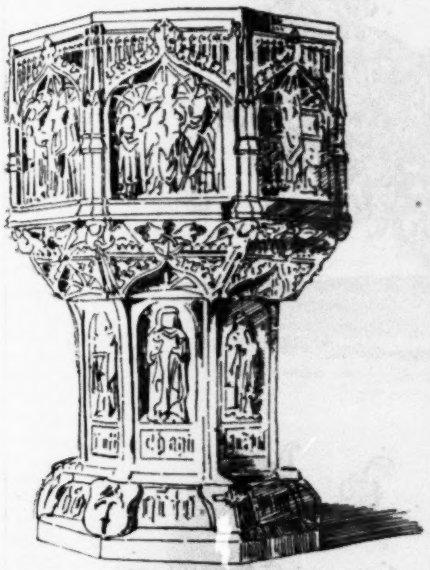

Fig. 1.—Walsoken.

Fonts of the second kind,—those which have the emblems of the Evangelists in the panels of the bowl,—occur at Wymondham, Blakeney, Fakenham, and other places. There are one or two very fine examples of this type near Norwich. Of these probably the font at Wymondham is the finest, but it has been very much defaced. The bowl has the symbols in four panels, and the other four are filled by angels holding shields, one shield being charged with three crowns. At the angles are pinnacles, and the bowl is supported by angels, whose wings cross each other. The stem has, below an embattled moulding and a row of pateræ, eight pedestals on the plinth, four having lions seated on their haunches, and four standing figures. The total height of the font is 3 ft. 11 in., and it stands on three steps.

The font at Blakeney (fig. 2) is of the same general design, but without the seated figures at the base, and has shafts at the angles of the bowl instead of pinnacles. Shields bearing emblems of the Passion occupy four sides of the stem, and the plinth itself is square, having four pedestals at the angles, which bear no traces, however, of ever having had figures on them.

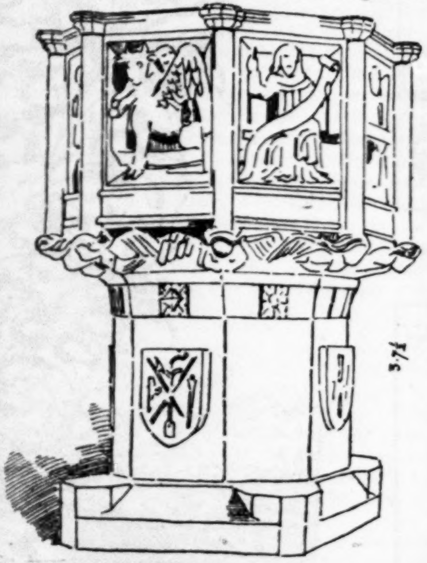

Fig. 2.—Blakeney.

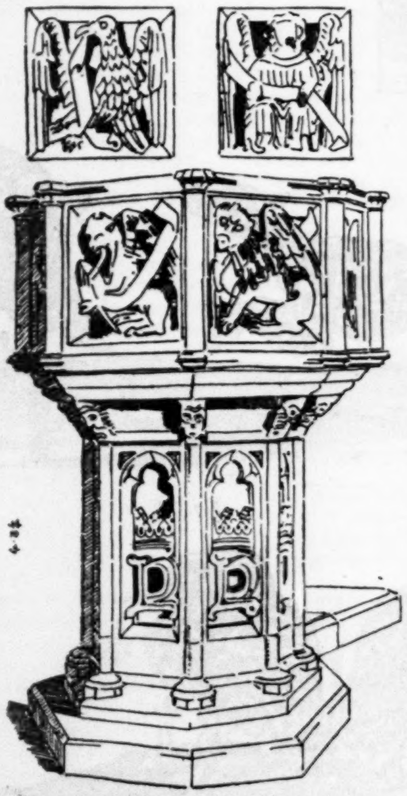

Fig. 3.—Fakenham.

The bowl at Fakenham (fig. 3) is similar to that at Blakeney, the panels being vigorously carved. The bowl is here supported by grotesques, which have a much earlier appearance than the rest of the font, and the stem has a panel on each face, in which is carved the monogram, "D.L." with a ducal coronet above,—referring to the connexion between the Church and the Duchy of Lancaster.

The example given from Leverington is, although strictly in Cambridgeshire, one of the Norfolk type. It has seated figures round the bowl, instead of groups, with bold pinnacles at the angles, supported by angels; a row of canopied figures round the stem, some kneeling; and a plain plinth with pateræ on each face. The font is carved out of a soft sandstone, and is much worn.

ON SOME DESIGNERS IN GROTESQUE.*

IN the works of Fantin (his curious little book was published "à Chasteaudun, 1619") and of Elias Holl (born at Nuremburg in 1638) we come across another distinct species of grotesque. It is a little difficult to determine to which of the two artists the quaint design, fig. 8, should be ascribed: it is nameless in the British Museum collection, but the treatment of the ornament seems to suggest that it is the work of the German rather than of the Frenchman. The design is typical of a great deal of decorative work executed in the seventeenth century. As we indicated in our issue of January 15, Le Blond and many other designers used to cut those of their patterns which were apparently intended for enamelling in white lines on a black ground. The design, looked at as a piece of engraving, was not very beautiful; but a new effect was produced, and it was seized on by a number of designers of grotesques, not because it gave some idea of the result of a design when finished in enamel, but simply on account of its bizarre appearance. The octagonal centre-piece in fig. 8 is, however, apart from its method of execution, a good study of line for line's sake: the space is very evenly covered, and the flow of the lines is exceptionally graceful. Fig. 9 is taken from Fantin's book, and fig. 10 from Elias Holl's; the main idea in both books is the same; there is little sketch of a rustic scene at the bottom of the page, and "in chief" a curious device in "enamel ornament." In one it takes the form of a beetle,—in another of a leaf: in one a simple lozenge,—in another a heart; and in one the drawing is of two sawyers in a saw-pit, the end of the log on which they are at work being ornamented in this way. Holl's book contains twelve plates of the months, the sketch being of the rural occupations characteristic of each.

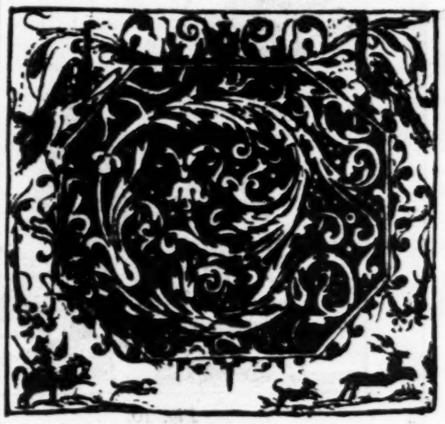

Fig. 8.

In the work of Peter Aubry, a printseller of Strasbourg, who was born at Oppenheim in 1596, we have another curious and grotesque use of decorative forms. From his *Newes Lauberbuechlein Zufinden* we have extracted a specimen, reproduced in fig. 11. The general idea in all the plates seems to be to treat a shrub in a conventional manner in the foreground of a landscape. The lines of the branches are always very gracefully drawn, and spring naturally from the main stem: the leaf much resembles the one with which we are familiar in the work of Aldegrever. Indeed, the whole conception seems to have been inspired by Aldegrever's designs, more especially those of his first period: the treatment of the plant has a most remarkable affinity with figures 20 and 21 of our issue of December 12th, 1885 (part II.

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* See lithograph plates in this number for illustrations of fonts at Walsingham, East Dereham, and Leverington.

* Continued from p. 600, *ante*.

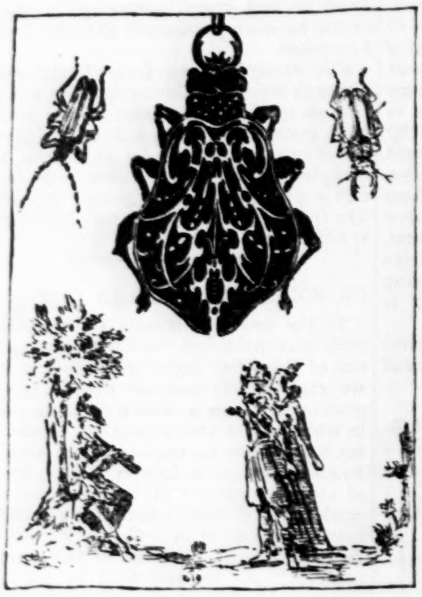

Fig. 9.

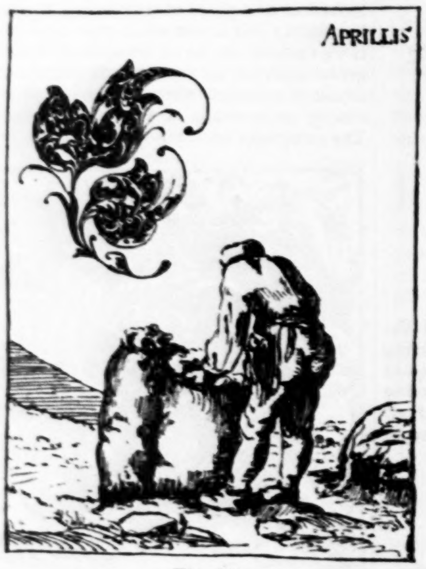

Fig. 10.

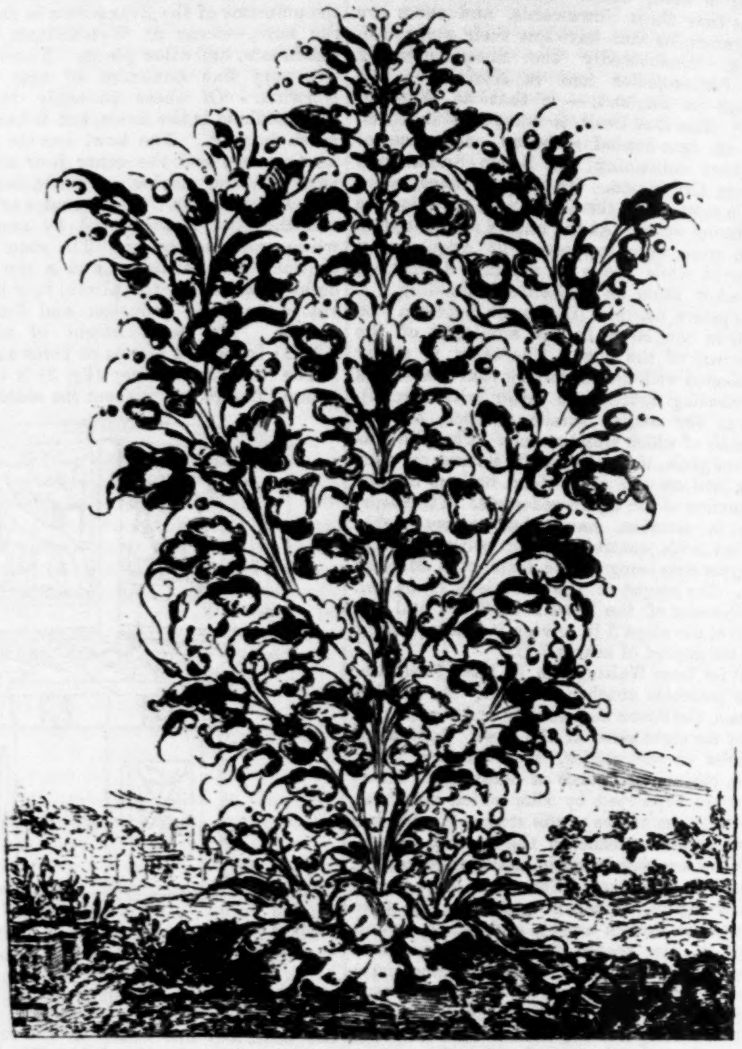

Fig. 11.

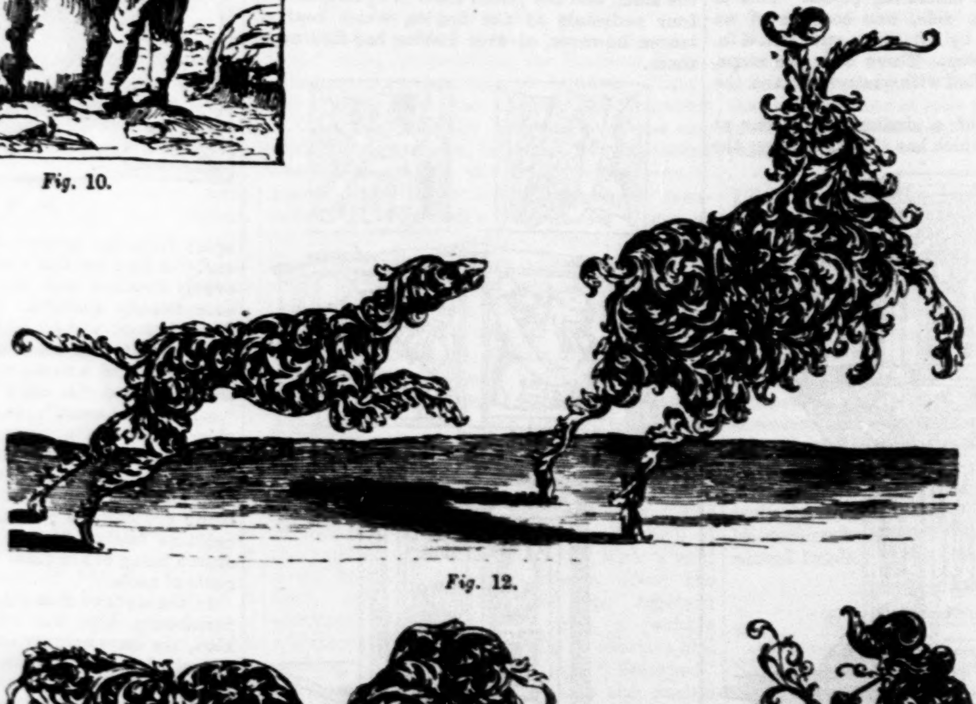

Fig. 12.

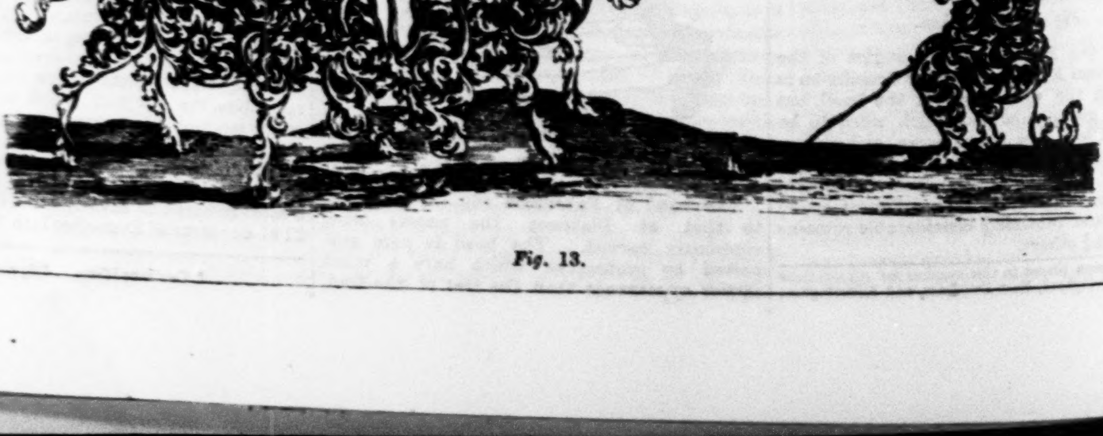

Fig. 13.

of "The Decorative Work of the Early German Engravers"), which are typical of this first period. The disfigurement of the landscape is, of course, Aubry's own idea. It is most curious to note how popular this grotesque form of decorative illustration became in the early part of the seventeenth century. Fragments of many books containing them abound, among which are to be noticed those by Baltazar Lemersier and Hans Georg Mosbach, both published by Baltazar Moncornet in 1626; and that by Pierre Labarre published in 1630, with conventional trees on a much larger scale than Aubry's.

But perhaps the most remarkable applications of serious ornament to grotesque purposes are to be found in the extraordinary designs of Wolff Byron von Bömmel, of Nuremburg. We have reproduced two (figs. 12 and 13) of the six which have recently been added to the British Museum collection. They exhibit the most marvellous command of curve-drawing,—every leaf comes away from another leaf, or its parent stem, in a perfect tangential flow. There is not a "dog's hind-leg" anywhere, not even in the dog's hind-leg itself; and there is not a line introduced, with the exception of the pipe and stick, which is not a legitimate line of ornament. The features even of the man's face are formed from the serrations in the leaf,—so, too, are the dog's jaws. The whole of the dog's head is, indeed, a masterpiece of constructive skill. The smoke, too, from the man's pipe comes in for conventional treatment, and forms a link between the early German work and the later French work of Pierre Bourdon, noticed in our issue of Jan. 8.

STRAY THOUGHTS ON EDUCATION.[*]

WE always feel a pleasure in communicating our experience to those who are younger, and when one fancies one has something to say on education, it is fascinating to say it to those who have felt the want of it, and especially to those who have started the only good school of architecture in the kingdom, a school, too, that no one is obliged to attend, so that every scholar is such in fact as well as in name. Every one of such scholars, to some extent at least, knows what he wants to learn, and tries to learn it in the best way he can.

I have always taken a deep interest in education, but I have unfortunately met with few books on the subject of any value. Mr. Herbert Spencer's is at once the best and most original of any that I have read, but that is on general education. He divides education into five heads of decreasing value, as follows:—First, How to preserve your life and health; secondly, how to get your living; thirdly, how to bring up your children; fourthly, how to be a good citizen; fifthly, how to amuse yourself and others. In this last he includes all the fine arts and languages; so it is practicaly what education used to be. I strongly recommend every one present who has not read his book[†] to read it, though it is not without some doubtful, if not erroneous, matter.

As the general education of the body is to exercise every joint and muscle, so the general education of the mind is to exercise all its powers. In early training the importance of general bodily and mental education cannot be too much insisted on, and this double education should never be wholly relinquished. Most of us, however, have to learn certain particular bodily and mental exercises, partly to get our living, partly to show mankind what we can do, and partly to benefit our fellow creatures.

Architectural education is mainly technical; I might say wholly so, because the art by which the higher emotions are excited in the beholder cannot be taught. The question we have to ask ourselves is how can the powers of each student's mind and body be so exercised as to make him the best architect he can be?

When I first read Adam Smith's "Wealth of Nations," I was struck with this remark that

> "Those parts of education . . . . . of which there are no public institutions, are generally the best taught. When a young man goes to a fencing or a dancing school, he does not, indeed, always learn to dance or fence very well; but he seldom fails of learning to fence or to dance."[‡]

The reason is plain, he wants to fence or dance up to a certain point. So it is with you. A student wants to learn something of construction, or planning, or designing, and he does learn this more or less well.

I particularly wish you to attend to this point, *i.e.*, what *must* be learned. There are many things which it is agreeable to know, and be able to do after one is an architect, but the one object is first to be an architect, *i.e.*, to be able to construct soundly, to plan conveniently, to arrange healthfully, and to design agreeably. Nor can one overlook this fact that there is now an examination to pass before you can enter into that select body of architects that forms the Royal Institute.

The requirements of that examination must have a great influence on your studies, and it is important that there should be nothing superfluous in it.

It is the fashion to talk of architecture as if it were a very easy and simple art, and that unless a man be equipped with many other things besides architecture he has not much to boast of. As Ben Jonson says of the cook, "He is an architect, an engineer, a mathematician, a philosopher"; you may put it down if you please to my incapacity, but I have never been able to agree with this view. You may instance Vitruvius, Orcagna, Brunelleschi, Leon Battista Alberti, Leonardo da Vinci, Michelangelo, or Sir Christopher Wren, and say these men were not only architects, but poets, painters, philosophers, and mathematicians, and what not besides, but these men were rare geniuses who appeared now and then, men of encyclopædian minds to whom the bulk of us are no more to be compared than Hyperion to a Satyr. The course should, in my opinion, be rather what the ordinary man proposing to be an architect can reasonably accomplish,—it is of course understood that he does make himself a capable architect,—I was almost inclined to say the average dunce, than to start it on the ground that every man ought at least to know what Wren knew.

Architecture is not one transcendental art, but at least two, science and art, combined with a very large amount of common sense, and one of these is mostly found to belong to a temperament antagonistic to the other, so that a great architect is the rarest sort of genius to be found.

Strong common sense is not unfrequently found in persons with great mathematical or with great artistic powers; but you want for a great architect one who has a mathematical mind, refined taste, and artistic invention as well, and the artistic temperament is mostly nervous and opposed to the mathematical.

We may, by stretching the term, call a man a mathematician who has a smattering of plain geometry and algebra, but no sooner do we take up any advanced book on statics than we find we cannot understand it unless we have mastered the differential calculus, and can use it like the multiplication table: yet how few men can master the differential calculus!

In the same way, many men pass their whole term of learning in learning to draw, and even then do not draw very well, setting aside all the difficulties to be overcome in learning to plan, to construct, and to design. There is, too, a vast body of necessary knowledge to be acquired in learning the qualities of materials, and the way they are to be put together. I therefore think we should endeavour to restrict our examination to purely necessary knowledge, and merely allow those who have more capacity to take in as much as they like.

I do not believe you can make a genius out of an ordinary man by any amount of education, but I think that if you will only force and cram a man enough you may turn a genius into an idiot.

Mark Pattison, who had plenty of examining experience, says "accumulated learning stifles the mental powers"; and again, "little did we foresee we were only giving another turn to the examination screw till it has become an instrument of mere torture which has made education impossible, and crushed the very desire of learning."

When the late W. Burges and I were in in Italy we thought a good substratum for an architect would be that he should be able to play the fiddle and hunt, read a Greek play at sight, and be a thorough master of the differential calculus: our ardour was rather damped by the reflexion that both of us would be excluded.

We all know too well the talk of what an architect should know: he should be a master of English; he should know who designed,—or is supposed to have designed,—every building in Europe, and all the styles of architecture that the world has known; and he should know all history, and at least the Latin, Greek, French, Italian, and German languages; but if we ask ourselves what an architect is wanted to do, we find all this mass of knowledge about as useful as dancing on the tight-rope. A client wants you to build him what he wants conveniently, soundly, and agreeably, and, I need not add, as cheaply as possible. If he asks you to an evening party. and you are young, he likes you to play and dance and sing; if he asks you to his country-house and you are middle-aged, to shoot, fish, and play at billiards; and if you are elderly, to talk well and play a good rubber at whist; but he does not employ you as an architect if all you can do is to waltz, play lawn tennis and amateur theatricals.

The old Duchess of Gordon wanted a cook, and heard that a neighbouring lady was parting with hers, so the Duchess called and asked about the cook. The lady replied, "She is a very decent body." "D—— her decency," said the Duchess; "can she cook collops?"

These remarks mainly aim at this:—Is the knowledge of every past style of architecture essential, or is it merely an accomplishment? Is knowing the name, or the supposed name, of the architects of the main buildings of the world essential or not? Did the Arab architects who built the great mosques, palaces, and tombs know who built the Parthenon? Did the Mediæval architects who built the castles, monasteries, and cathedrals know? As we have no national architecture at present, and many of us get our living by tinkering up old buildings in the way they were supposed to be built, I am forced to admit that knowing what mouldings, what ornaments, and what construction people used at certain former periods, may be useful for enabling some of us to get our living,—but it is archæology and not architecture.

When architects come to be equal to the old Mediæval ones they will not trouble their heads about what their inferiors did, and I think that we might with advantage supplant the present method by asking a candidate how he would make a moulding, or a group of mouldings that would produce a given effect; at any rate, that would employ other powers of mind than mere memory.

I would also abolish the word "style" from the instructions for the design, and say the building is to be made beautiful, imposing, threatening, or what not. We want rather to encourage originality than copying, and considerably more time should be given to this subject than is now allowed. One whole day may be well given to the plan and elevation and another to the practical section and details. In the other questions, too, I would suggest that they be mostly simple and straightforward, capable of really testing the necessary minimum of knowledge, and free from those catch questions which may have been picked up by an examiner during a thirty years' practice.

I think we lack system in our education. With us all is haphazard. I am not inclined to run this down so much as most people, for "self-taught is well taught," but time may be money, and power too, and if we can teach systematically what is really wanted we can, perhaps, save the time generally lost in blundering about till we find our way.

If it be possible I would have every master (it is the fashion to call them "Professors" now) an architect, because he will be most likely to bear in mind what is wanted for an architect.

I cannot too strongly insist on having the most able man that can be got for each master.

The Jesuits were, I believe, the best schoolmasters the world has known, and they always put their best and most learned men to teach the elements. Good habits are most important, and the man who is deeply versed in his subject knows what is most likely to be of the greatest ultimate use.

Professor De Morgan used to say, that in teaching algebra, it should be so arranged that it rendered the after-learning of the differential calculus easier; but there is also this to be said, that a man ought to have the gift of teaching, or at least of making people learn. Doubtless, one of the great things is to make each man use his brains as much as possible, but if your master has not the gift of teaching he is too apt to be like the man with the seven-leagued boots, at his first step he is out of sight, and this is discouraging to all but the aptest and most robust scholars; but even such a man is much better than a teacher who is only one or two steps in advance of you,—he cannot really teach you anything but bad habits. I think that practical geometry, stereotomy, and stone-cutting are shamefully neglected amongst the English architects.

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[*] By Professor G. Aitchison, A.R.A., being a paper read before the Architectural Association on the 22nd inst., as elsewhere mentioned.

[†] Education. By H. Spencer. 8vo. Williams & Norgate, London and Edinburgh. 1861.

[‡] Book v., chap. 1, p. 158. 8vo. London. 1796.

All the great architecture of the world has had geometry for its basis, and I fear little that is great and good will reappear until architecture has been again based upon it.

What the architectural teaching in the Middle Ages was is unknown to me, but we all know its results. That geometry in a practical form must have been well known both to architect and mason can be deduced from their work with as much precision as a proposition in Euclid, and we know too that most of the architects were called stone cutters.

The Bons who came from France to build the Ducal Palace at Venice were called stone-cutters. Longhena, the celebrated Venetian architect, who was not born until the end of the sixteenth century, was the son of a mason, and carried on the business till his death.

Although T. Hope says that some descriptive geometry was used by the Mediæval architects for getting the thrust of their vaults, and Viollet-le-Duc also gives a diagram of this method of ascertaining thrusts, it is probable that their great skill in construction was mainly due to experience, observation, and daring. In the twelfth century, in France at least, a good many of their buildings fell down or went to ruin. If the architects mostly rose from the mason's banker, they were possessed of practical experience as to the quality and behaviour of various sorts of stone, and I look upon it that they acted as a chair-maker does now,—he has stock scantlings for chair-frames, and he lightens them till some chair gives way; but nowadays we have analyses and easy means of testing the strength of materials, but at the same time we are absolutely without the practical experience and that close knowledge of the materials that these Mediæval architects had, and we lack their close reasoning, inventiveness, and daring in construction. Every man preparing to be an architect should be able to solve the statical problems of how thick an isolated wall should be in proportion to its height, to resist the force of wind, to bear a given weight, and to resist a given thurst, the formula for the resistance of uprights to a downright weight with the coefficients for brick, stone, iron, and timber, the pressure of water against the sides of a tank, the thrusts of arches, groined vaults and domes, the statical problem of girders, trussed and otherwise, and of roofs.

There is a shocking want of any good text-book on this subject. There wants to be one made for architects, not only clearly explaining the reasoning and giving the formulas, but working out practical cases in various materials. Is there any book that gives the problems of stone and brick spires, both vaulted and corbelled, or of tall chimney-stacks?

In the same way there wants to be a good text-book for practical geometry, stereotomy, and stone-cutting.

South Kensington has published a book in three volumes on building construction and materials, but I cannot say what its value may be.

An architect must know the main qualities of the principal materials he uses, and how mortars, cements, and concretes are made, and what weight they will bear, after what time; and he must know enough about the methods of putting materials together to ensure safety and success.

He must know, too, the main principles of healthfulness in buildings, and the proper methods of ensuring the results. There must also be added to all this, some of those subjects which are commonly called professional, that touch on the law of contracts, of rights, of easements, and those laws made expressly for buildings.

I would hold forth for your admiration and imitation, the engineers; they had a new material to deal with,—Iron. And by logic, science, daring, and invention they have built structures that rival those of the Middle Ages in lightness, originality, and daring, but the engineers have eliminated beauty from their structures.

The art of planning is primarily the use of common sense directed to this particular object, but after examining many plans of similar buildings we see, that some are much better arranged than others merely as plans, and we also see that amongst the great architects some had the gift of making excellent plans as plans with this added, that they were more original and effective, and lent themselves to exterior features that are striking or impressive.

Amongst English architects, the plans of Wren and Vanbrugh are excellent and original, and so are those of Soane and the late Sir Charles Barry. Longhena's Sta. Maria della Salute is a marvel, and M. Chas. Garnier's plan of the Opera is admirable.

The way of teaching, or the way of learning, how to make things beautiful is a different matter altogether.

The English are born constructors, but during the latter part of their career, excluding the present time, we could hardly venture to say that they were born artists.

I think that we may fairly say that proportion is the soul of architecture. How is proportion to be taught? The Greeks had by experience found that certain proportions were satisfactory, and had noted them down as we learn from Plato and Vitruvius, and we try to cultivate our eye, by drawing out Greek buildings and their parts, by calculating their proportions and by studying them, or casts of them, and we pursue the same plan with all buildings, the fame of whose proportions has been accepted by successive ages. And when we are more advanced we apply the same means to ascertain the proportions of those we admire, and we paraphrase them; we also try to improve our sense of proportion and beauty by the study of nature, in every one of her manifestations.

Doubtless man and flowers give us the most beautiful instances, but lessons are to be learned from animals, from trees and rocks, from the heavens and the waters.

On the road to Amalfi there are series of rocky points that at a distance look like the spires and pinnacles of some Gothic town.

"Mouldings," says Viollet-le-Duc, "are architecture." By studying the Greek mouldings we learn the infinite trouble taken to make them elegant and effective, and they are without doubt the finest that the world has seen, but they were made for a sunny climate, and were executed in marble, and are ineffective in England,—absolutely so when the sun does not shine. I think we cannot study them too closely, not for imitation, but to learn the causes of their success.

When the early Renaissance architects tried to give some of the grace and elegance of the ancients to their buildings, they were delightful; but when the later architects raised the Roman orders into divinities that could only be humbly imitated, their buildings rapidly sank into dreariness and insipidity, and only emerged from it to fall into contortion.

I must perforce hold up the Saracens and the Mediævals for your imitation, as regards their mental attitude. When they began to build they were little better than barbarians, and what the Romans had done appeared to them to be the work of enchanters; but they soon surpassed their masters, and you can readily fancy with what contempt the architect of the honeycomb domes at the Alhambra, or the architect of St. Urbain at Troyes, or of King's College Chapel at Cambridge, looked down on the Roman architects. The works of these Saracens or Mediæval architects were like Newton's "Principia" to his seventeenth-century contemporaries; the question was not who else could have written it, but how many people in Europe could understand it when it was written.

We have plenty of examples of artless buildings now in houses and warehouses, which are simply dead walls with holes in them; the question for us is, how can we make them beautiful without copying? We have wood posts and girders and trussed roofs. What can we do to turn these into beautiful objects? Each one of you may possibly say, if I could make these things beautiful to my own taste, how can I be sure that any one will like them? You cannot be sure, and therefore the only hope for architecture is that those who have this noble ambition will consider it to be its own reward; it is only by this self-denial and devotion that any art, calling, or occupation can be ennobled. Read Brunelleschi's life. This able sculptor was ready to travel to Rome and gain his living as a goldsmith, so as to be able to study Roman ruins and the Pantheon, and to ponder how the cathedral at Florence could be domed. He met with success, and became immortal; but he might have perished unknown in his attempt,—"unwept, unhonoured, and unsung."

When I was a pupil all the architectural instruction that was to be had was in an office; books were rare, and the teaching at the Royal Academy was confined to six lectures, and a permission to draw from the antique. Thanks to the Royal Academy, the Royal Institute of British Architects, and to South Kensington, books are only too plentiful; there is some teaching, and a good deal of direction, and, thanks to yourselves, there are the means of supplying in some measure what is deficient elsewhere.

In common justice, I must say the young architects of to-day have in certain respects made a noble use of their opportunities, their powers of delineation are such that in my youth all the architects would have crowded to see them as they did to see the drawings of Barry, Cockerell, and Pugin. The best of them would have been snatched up as illustrators of books. The architectural skill, too, exhibited in private buildings is as delightful as it is extraordinary, and all that seems to me to be wanting is more thorough and systemalic teaching, a greater unanimity in the choice of a type, so that all the isolated and divergent energy of the profession may be applied in one direction to the furtherance of our art, that a greater determination to invent rather than to paraphrase may show itself, and that more attention may be paid to the perfecting of monumental art.

I trust that some of you gentlemen will find time to attend the discussion on teaching at the ensuing Conference meeting, and will give us in short any matured judgment you may have formed on the subject.

[For a report of the discussion which followed see p. 654.]

HENDON DRAINAGE WORKS.

THESE new works, constructed at a cost of 60,000*l.*, were opened on Saturday last, and the Local Authorities were able to signalise the occasion by securing the presence of Mr. Gladstone, who is residing in the neighbourhood, at Dollis Hill, and who made a speech on the vast improvement in the public health of the country, and the energy and enterprise displayed in the construction of improved systems of sewage disposal within the last few years. The Hendon scheme is on what is known as the lime and filtration system, though there are special features introduced with the view of securing even a greater degree of efficacy than that hitherto attained. It may be mentioned, in the first place, that the system provides for the drainage disposal of the sewage of Hendon, Childshill, Cricklewood, Golder's-green, and Temple Fortune. The total length of the sewers is 14½ miles, and they vary in size from a 3 ft. circular brick to a 9-in. pipe sewer. The whole district contains 8,382 acres, and the rateable value is 101,000*l.* The population in 1881 was 10,484, but the scheme provides for a population of 24,000*l.* At the works, which have an effluent outfall into the Brent, the coarse solid matters are removed by straining; lime is introduced for the purpose of defecation and precipitation of some of the organic matters, and the resulting suspended matters are removed by settlement in tanks; the effluent water from the tanks is purified by filtration through specially prepared beds.

At Hendon, lime is, as already stated, used, but differently from the lime treatment pursued elsewhere. It has been considered that the addition of what is called "milk of lime" is not so effectual as if the lime added is lime water, because it is only dissolved lime, or that in solution, which is effectual. All sewage is highly charged with carbonic acid, and the particles of lime in the milk of lime combine with the carbonic acid, and form a coating of carbonate of lime on the outside of the particle which is insoluble, and the lime cannot enter into solution, and is prevented from doing its work. At Hendon works, one-sixth part of the whole sewage is withdrawn from the carriers, and pumped into a continuous mixing vessel, provided with agitating arms. Then milk of lime is added containing lime equal to 15 grains per gallon of the whole sewage, or 90 grains per gallon of that passing through the lime-water mixing apparatus. The lime is thoroughly dissolved, and the lime-water so obtained is added to the remaining five parts of the raw sewage, mixed by a salmon ladder arrangement, and run into one of the settling-tanks. After five or six hours' rest in the tanks the effluent water is run on to the filter-beds. The sludge is pressed into portable cakes by Messrs. Johnstone & Co.'s presses. The effluent from the filter-beds is discharged into the Brent.

The quantity of lime used for treatment is a little less than 2 cwt. for every 100,000 gallons of sewage entering the works, and about 100 lb. of lime for every ton of compressed cake turned out from the presses.

The annual cost of working the whole system is estimated at 570*l.* The method of precipitation by lime, supplemented by land filtration, adopted at Hendon was recommended by Professor Frankland and Dr. Stevenson, and approved by Dr. Dupré. They consider that no addition to the lime in the shape of sulphate of alumina is necessary when precipitation is supplemented by land filtration. To carry out the recommendation of properly dissolving the lime in one-sixth of the volume of sewage and afterwards mixing it with the remaining five-sixths required specially-designed machinery, which has been manufactured by Messrs. Johnstone & Co., of Stratford. Some difficulty was experienced when it was discovered that the site of the proposed filter-bed consisted of a stiff clay; but the difficulty has been overcome by the engineer, Mr. Cousins, by placing in the bed 14 in. of burnt ballast, with trenches of that material at intervals, averaging 5 ft. 6 in. in depth; and on the surface 1 ft. of mould. The beds have an area of 30,300 square yards. Mr. Harry Smith, of Chiswick, was the contractor for the works, which have been carried out in a substantial manner. It may be said that the general outline of the scheme was designed by Mr. Pollard, the former engineer to the Hendon Local Board, but many important alterations have been made, and the scheme completed, under the superintendence of Mr. Cousins.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

THE Easter term closed on Saturday by the delivery of the report of the examiners on the students' work for the term, and the presentation of the certificates awarded. Sir Robert Rawlinson presided and presented the certificates. The report of the examiners, Messrs. W. Crickmay, C.E., and W. Lawford, C.E., having been read,

The chairman addressed the students. This, he said, was the third occasion of his having had the pleasing duty entrusted to him that he had again to discharge. It gave him great pleasure to come amongst the young men, and if any words of his could give them stimulation and encouragement in their work, his doing so would give him personal gratification. Some young men, and elder people also, were disposed to regard the future as a gloomy prospect, and sometimes the discouragement was natural. He advised his young friends to hopefulness. The world was not to be taken by storm; ability, patience, perseverance, and steady application, would succeed in the end. He would advise them not to be too particular as to what they might get to do at first, not to think they could pick and choose, accept this and reject that, at their pleasure, but to take any honest, honourable, manly work, which was no disgrace to the son of either prince or peasant, that might come in their way, and what their hand found to do, to do it heartily. Vast fields were open and opening for the employment of young engineers of capability and worth. Japan had begun, China was beginning to require their services, they had the fields of India, Burmah, the Australasian colonies, North America, South Africa. Sanitary works were needed in all of them; in some water-supply was an urgent want, roads, railroads, and harbours had to be made, and structures of all kinds had to be put up. In these the young engineers of this country, and of this school, would find ample scope for the employment of their best powers. He hoped that in their future career his young friends would sustain the reputation of England for honour, probity, and truthfulness.

The reports of the Examiners on the students' lecture examination and work done during the term were in highly commendatory terms. They also ascribed unqualified praise to Mr. Wilson, the Principal, and his staff, for their excellent methods and great pains taken with their pupils. The lectures for the term were on "Steam." Twenty-eight of the students were eligible for examination, of whom sixteen received certificates. B. G. Lloyd was first with 238 of an attainable 277 marks. In the drawing office nine certificates were awarded, E. C. R. Nelson first; in the pattern and smiths' shop, ten certificates, J. S. Lea first; in the fitting-shop, ten certificates, J. H. Chute first, also second for lecture examination, with 211 marks. In the Civil Engineering Section, five certificates were awarded for students of the first term; general surveying and preparation of plans for Parliament, W. E. Underwood, first; second term, calculations, plans, and estimates for a railway and dock, eleven certificates, E. J. Prew, first; third term, designing and construction of existing and other engineering works, twelve certificates, F. B. Dixon, first; fourth term, sanitary work and water supply, three certificates, H. A. Minchin, first. Four first-grade and two second-grade certificates were awarded in the Colonial Section. To J. F. Harrison the examiners awarded the Bronze Medal of the School of Art, Science, and Literature. Of the students who have passed through the School, 151 have become Students, and 53 have been elected Associate-Members, of the Institution of Civil Engineers.

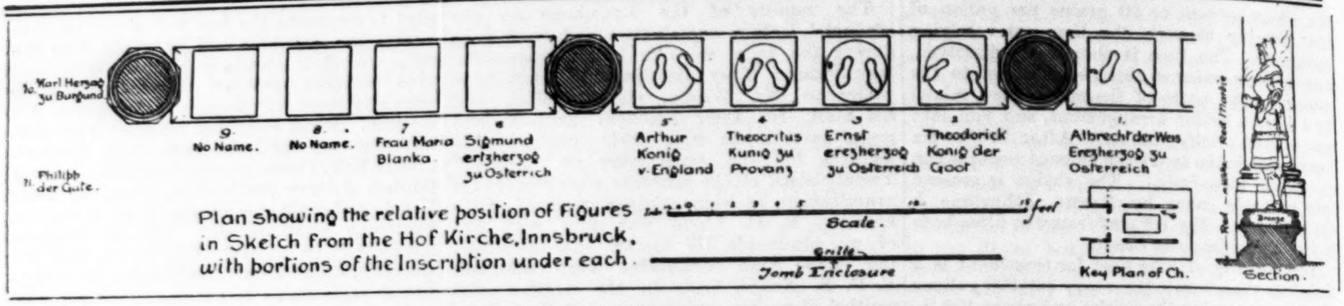
ARCHITECTURAL SOCIETIES.

Leeds and Yorkshire Architectural Society.—The annual meeting of the members of this Society was held on the 21st inst., the President (Mr. C. R. Chorley) in the chair. The Secretary (Mr. E. J. Dodgshun) read the eleventh annual report, in which the Council stated that they saw cause for congratulation in the steady increase in the number of the Society's supporters, and the greater influence which it exerted from year to year by co-operating with other societies for the advancement of architectural education and professional practice. The uses of the museum were gradually being more fully understood by the public, and members and exhibitors alike were making use of the facilities which the institution offered. The trades' catalogue library was maintained in efficiency. The sanitary exhibition was open to further extensions. The library had received more attention, a donation of 20*l.* from the funds of the society, and a gift of 5*l.* 5s. from Mr. C. R. Chorley having been made. The Council was also indebted to its honorary treasurer (Mr. J. B. Fraser) for a very valuable gift of four large cases of timber samples, together with a MS. descriptive catalogue, which was being printed by the Society. Other members had also made contributions of books. Now that her Majesty had granted a supplementary Charter for the purpose of effecting certain reforms in the constitution of the Royal Institute of British Architects, the Leeds Society were anxiously looking forward to changes which would enable all provincial architects to benefit more fully from a connexion with the Institute. The Hon. Secretary, Mr. G. B. Bulmer, having resigned, his resignation was accepted with regret, and the best thanks of the Council, on behalf of the Society, were tendered to him for his valuable services during the last four years. Mr. E. J. Dodgshun had been appointed as his successor. On the motion of Mr. J. W. Connon, seconded by Mr. J. Rhodes, the report was adopted, after which officers for the ensuing year were appointed, including Mr. Chorley as president, Mr. J. B. Fraser as treasurer, and Mr. E. J. Dodgshun as secretary.

Northern Architectural Association. — The annual meeting of the Northern Architectural Association was held in the Old Castle, Newcastle, on Tuesday afternoon, Mr. E. Shewbrooks presiding, in the absence of Mr. Hoskins, President. Mr. Frederick Clark and Mr. W. J. Moscrop, jun., were elected members of the Association. The Hon. Sec. (Mr. F. W. Rich) read the report of the 28th session, which stated that reference was made in the last annual report to the probability that, owing to the revision of the rules, the roll of members would be increased, and the committee were glad to announce the fact that since that date twenty-one members had been added to the roll,—viz., four members, eight societies, and nine students,—and on that day six more members stood for nomination, and two for election. Eight excursion meetings were held last summer,—to New Town Hall, Middlesbrough, Raby Castle, Elswick Works, residence of Captain Andrew Noble, C.B., Jesmond Dene House, and residence of the Hon. Secretary. Sketching meetings were held at Hexham Abbey, Seaton Delaval Hall, Ryton, and St. George's, Cullercoats. The question of federation or registration had engaged the attention of the committee, and they had the pleasure of reporting that the President had been appointed a member of the Special Federation Committee on the Royal Institute of British Architects. It was decided to offer prizes to students for excellence in design and construction. The treasurer's statement showed a small balance in hand. The Chairman, in moving the adoption of the report, said that the Association promised to prosper. The designs which had been sent in reflected great credit on the young gentlemen who had competed. It must also, he thought, be a matter of gratification that they had got at least the nucleus of a library. The report was adopted, and after the transaction of formal business the meeting terminated.

Edinburgh Architectural Association.—The members of the Edinburgh Architectural Association visited Dirleton Castle on Saturday afternoon last under the guidance of Mr. David MacGibbon. The conductor first drew attention to the exterior of the castle, and pointed out the advantages of the site for defence, the wall being built on a rock, which, although not lofty, was too hard to be undermined, and the whole being surrounded with a wet ditch. This was crossed by a long wooden gangway, the stone pieces to support which still exist, and part of which formed the drawbridge. The oldest parts of the buildings date from the thirteenth century, and formed a portion of the castle which was besieged and destroyed by Bishop A. Beck in 1298. These consist of three large towers at the south-west angle, and a part of a tower at the south-east angle, all the details of which belong to that period. The castle was rebuilt, to judge from its style, in the fifteenth century. The entrance gateway with the portcullis room above, the hall and other buildings on the east side, are all parts of this restoration. The hall has been a splendid apartment, 72 ft. by 25 ft., with screen and minstrels' gallery at the south end, and the dais and lord's apartments at the north end. The kitchen is on the same level, and has a very lofty vault with aperture for ventilation. It is provided with two large fireplaces and a good service-room; below this are the bakehouse and wine-cellars. Under the lord's private room are guard-room and dungeon. In the sixteenth century a private dining-room and other apartments were erected at the south-west angle of the courtyard,—dining in the hall being then given up. The gateway in the outer enclosing wall and the dovecot were pointed out as deserving of notice. Dirleton belonged in the thirteenth century to the De Vaux family, whose heiress brought it to Sir John Haliburton. His grandson, created Lord Haliburton in 1440, was Lord Treasurer for Scotland, and the castle was probably restored by him. In 1603 the property was conferred by James VI. on Sir T. Erskine, who saved the king in the Gowrie conspiracy. It afterwards passed into the hands of Sir James Maxwell, and in 1663 was purchased by Sir John Nisbet, who, as Lord Advocate, bore the title of Lord Dirleton. The castle still remains in the possession of his descendant, Lady Mary Nisbet Hamilton, to whose taste and liberality the public are indebted for the careful preservation of the buildings and ready access to the beautiful gardens which surround them. At the close of a very enjoyable day a hearty vote of thanks was accorded to Mr. Mac Gibbon for his interesting paper.

Paisley.—The infirmary which for many years has served the wants of the burgh of Paisley has of late been found altogether inadequate to meet the demands made upon its resources, and increased accommodation has become an imperative necessity. At present the accommodation of the infirmary is limited to about 120 beds, and the directors propose to add 80 to this number, which would entail an outlay of about 8,000*l.*


10. Karl Herzog zu Burgund
11. Philipp der Gute
9. No Name.
8. No Name.
7 Frau Maria Blanka
6 Sigmund ertzherzog zu Osterrich
5 Arthur Konig v. England
4 Theocritus Kunig zu Provanz
3 Ernst erezherzog zu Osterreich
2 Theodorick Konig der Goot
1. Albrecht der Weis Erezherzog zu Osterreich
Plan showing the relative position of Figures in Sketch from the Hof Kirche, Innsbruck, with portions of the Inscription under each.
Scale.
feet
Grille
Tomb Enclosure
Key Plan of Ch.
Red Marble
Bronze
Section.

Illustrations.

EDINBURGH CASTLE: A SUGGESTION.

The lamentable state of the buildings which compose Edinburgh Castle, as they are now and have been for the past two hundred years, is a standing disgrace to the country. Perched in mid-air, in one of the most prominent positions of any building, ancient or modern, in the world, they stand in the most abject state of desolation as regards architectural beauty. What they were in ancient times can to a great extent be gathered from drawings which have from time to time been published; and the accompanying suggestion is intended to show what might be done to make the present uncouth mass more presentable and more worthy of its past glories and traditions.*

The side represented is by far the finest view of the castle, and is taken from a south-east point, somewhere about the position of Heriot's Hospital. It shows the royal apartments or lodgings in the south-east angle, with the Half-moon Battery on the east, and the old Parliament Hall to the south.

This Hall, so rich in historical memories, has been sadly ill-treated from time to time, and is now cut up by floors and partitions, and serves as a hospital for the garrison. The author of the accompanying design (see phototype plate in this issue) had the privilege of examining it through the courtesy of the Engineer officer in command a year or two ago, when alterations were being carried out in the interior, and when some curious discoveries were made in the wall-panellings and floors. Much of the old open roof framing was then exposed from the interior, showing the early fifteenth-century work, very much shorn of its ornament; an enriched stone corbel remains supporting one of the principal rafters of the roof; it seems to be of a much later date than the roof, being decidedly Classic in its character; it is possible that the early and severe corbel may have been carved in this style when the more modern additions were made to the castle in the sixteenth century. The south side of the Parliament Hall is at present disfigured with a corbelled-out erection used for latrines and other sanitary provisions connected with the hospital, and from it an external drain, composed of huge cemented clay-piping, coils its unsavoury way down the venerable rocks like an enormous serpent. All the windows of the Hall are blocked up or removed, and the outer roof has sunk below its old level, and is broken up with a row of storm windows of a decidedly workhouse character which peep over the old corbelled parapet. In the drawing all this has been removed, and the large mullioned windows have been restored.

The Royal Lodgings, being, as their name indicates, the domestic portion of the castle buildings for the use of the royal household, extend from the east end of the Parliament House round the south-east corner, and terminate at the Half-moon Battery, built by the Regent Morton. These buildings are of several periods, the lowest portions consisting of dark stone arched vaults cut on one side out of the solid rock, which also crops up in the floor, which is simply the virgin rock roughly levelled. These vaults were used as dungeons, some of the iron rings to which the unhappy prisoners were chained still remaining in the walls. Many of these lower vaults and those below the Parliament Hall and in the block of buildings beyond are of a very early date, and are, in all probability, part of the buildings of a very early period. Several curious, straight, narrow stairs, made in the thickness of the walls, lead up to the rooms overhead. The upper part of these walls is mostly of fifteenth-century work although repaired and added to in the sixteenth century, the most modern part being that over the Half-moon Battery, which is dated 1613.

All these buildings are shown with a new roof of a picturesque and varied skyline. The oriels have been restored and the upper part of the buildings generally adorned with corbelled-out parapets, gargoyles, turrets, crow-stepped gables, and details of the sixteenth-century Scottish baronial architecture, all the lower portions of the buildings being left untouched. The more modern part of the Royal Lodgings has been raised by the addition of a high-pitched roof with dormer windows in place of the old flat roof, the angle turrets being finished with ogee terminations.

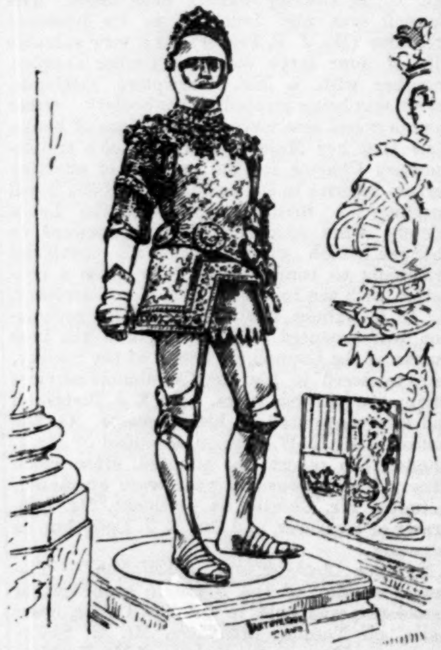
At the back of the Half-moon Battery is shown a restoration or rather rebuilding of David's Tower as near its original site as possible. This tower was built by David II. about 1380, and was for long the most conspicuous object of the castle buildings, but was battered down in Drury's siege of the castle in 1573.

The parapets below the Parliament Hall have been restored in accordance with the rest of the proposed work above, and a large circular tower placed on the corner of the block beyond the Parliament Hall to the west. Beyond this, again, is seen the hideous block of barracks erected at the end of the last century. It is proposed to improve this by throwing out towers breaking the monotony of the line of buildings somewhat in the manner of Fyvie and Saltcoats Castles.

Walter F. Lyon.

IN THE HOF-KIRCHE, INNSBRUCK.

We give a reproduction from a drawing by Mr. W. J. N. Millard of the celebrated Tomb of Maximilian I., in the Hof-Kirche at Innsbruck, or rather of a portion of the remarkable group of bronze figures of kings and heroes which surround the tomb, and to which mainly it owes its fame. There certainly never was a more weird or poetic idea in relation to monumental design than that of surrounding a tomb with this guard of solemn, silent, bronze figures, standing as if they had taken up a position for the moment round the tomb to do honour to the remains of the monarch buried there.



The Figure of King Arthur, Maximilian Tomb, Innsbruck.

The tomb, which is itself adorned with delicate sculpture, and enclosed, like our Henry VII.'s tomb, with a high grille of elaborate metal work, stands in the middle of the nave, whilst between the columns of the arcade are ranged the attendant figures, face inwards, twelve on each side, with two couples more flanking the entrance to the chancel. The small plan subjoined shows the positions of the figures in the plate, No. 1 in the plan being the foreground figure. They are all gorgeously clad in full armour or dress of the richest description, though as statues they are not all equally well conceived and modelled. In fact, there is something almost grotesque in the pose and general treatment of several; but conspicuous among the company for spirited action combined with fine execution, stands "Arthur König v. England," as runs the legend inscribed beneath him,—a figure of which Mr. Millard gives a separate sketch, and which may well cause an Englishman a passing sensation of pride in being represented at the tomb of an alien monarch by so gallant a knight.

The pictorial effect of the great dark bronze effigies and the polished red marble columns together, opposed to the light streaming in from behind them, is not to be readily forgotten.

FONTS.

For descriptive article relating to the fonts shown in our lithographed illustrations, see "Some Norfolk Fonts," p. 632.

PREMISES IN BROOK-STREET, HANOVER-SQUARE.

This block of buildings has just been erected next to the gabled house at the corner of New Bond-street, and advantage has been taken of the prominent position to provide saloons above the shops, with large show windows for the display of goods. In addition to the three shops on the ground-floor, a top-lighted picture saloon has been formed in the rear, and the two upper stories are constructed especially for a photographic studio.

The whole of the front above the shop cornice is in terra cotta, of a warm brown tint, supplied and fixed in a very creditable manner by Messrs. Wilcock, of Burmantofts.

Messrs. N. S. Joseph & Smithem were the architects, and Messrs. Killby & Gayford the general contractors, Mr. Charles Evans supplying the wall tiles and painted-glass decoration.

ST. SAVIOUR'S UNION INFIRMARY, CHAMPION-HILL.

In our issue of February the 26th we gave a view of a part of this large building, with plans and particulars of it generally. At the request of the architects, Messrs. H. Jarvis & Son, we give a bird's-eye view showing the whole building, as the drawing published before, showing the administrative block to a tolerably large scale, gave no idea of the size of the whole building.

In reference to the description of the work in the *Builder* for February 26th, Messrs. Jeakes & Co. ask us to state that they executed the work for the steam cooking and steam laundries.

EDINBURGH MUNICIPAL BUILDINGS DESIGNS.

Sir,—I notice in your last issue you call attention to an apparent discrepancy between the plan of my design for Edinburgh Municipal Buildings and the elevations.

The apparent discrepancy arises from the omission on the part of your printer (from the title) of the words "Alternative Plan."

I may add that I asked you to publish the alternative plan, as I thought it rather better than my other plan.

Brightwen Binyon.

⁂ It is rather illogical, however, to send us up elevations of one design and plans of another.—Ed.

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* We are not, of course, responsible for Mr. Lyon's opinions or suggestions.—Ed.

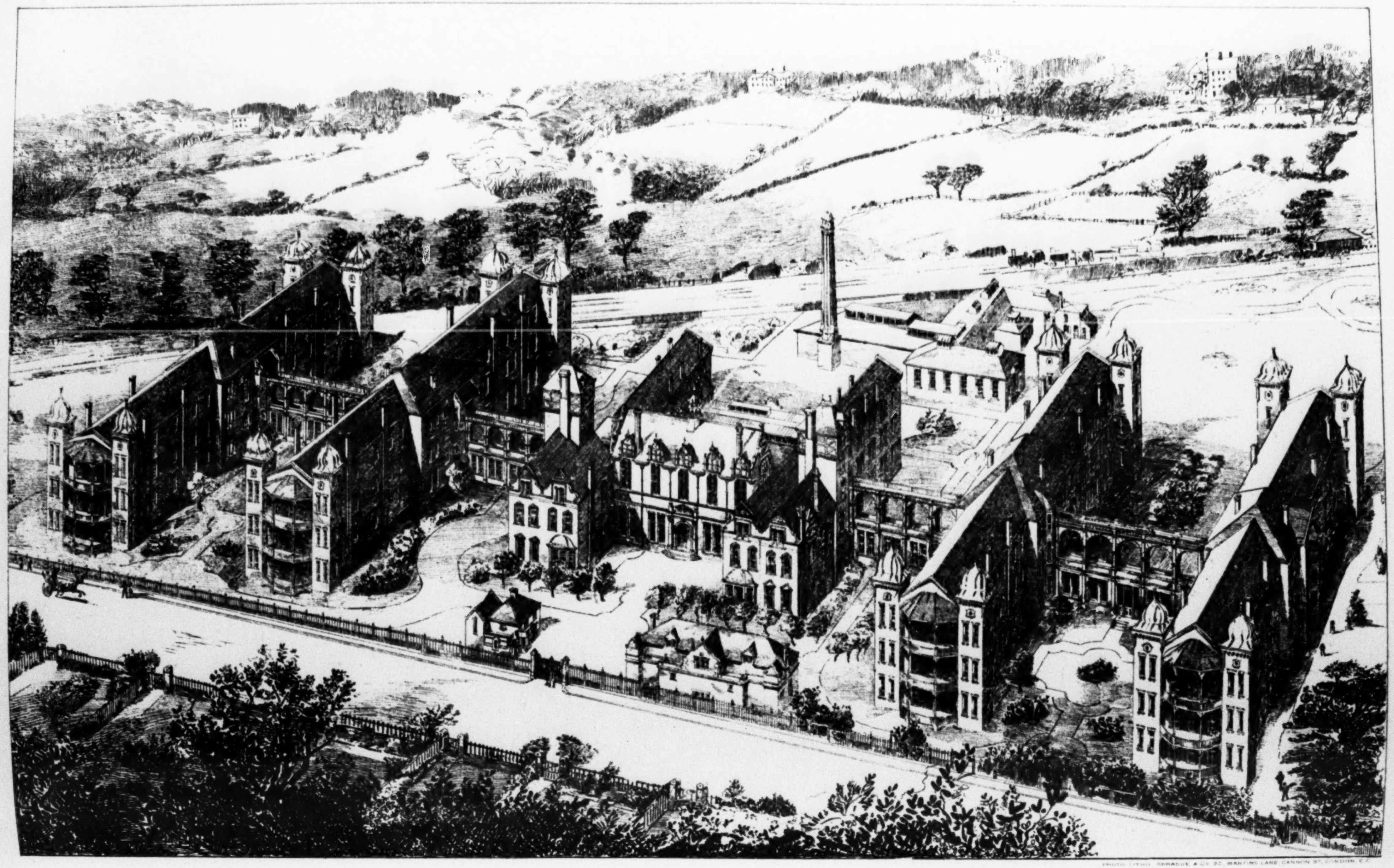
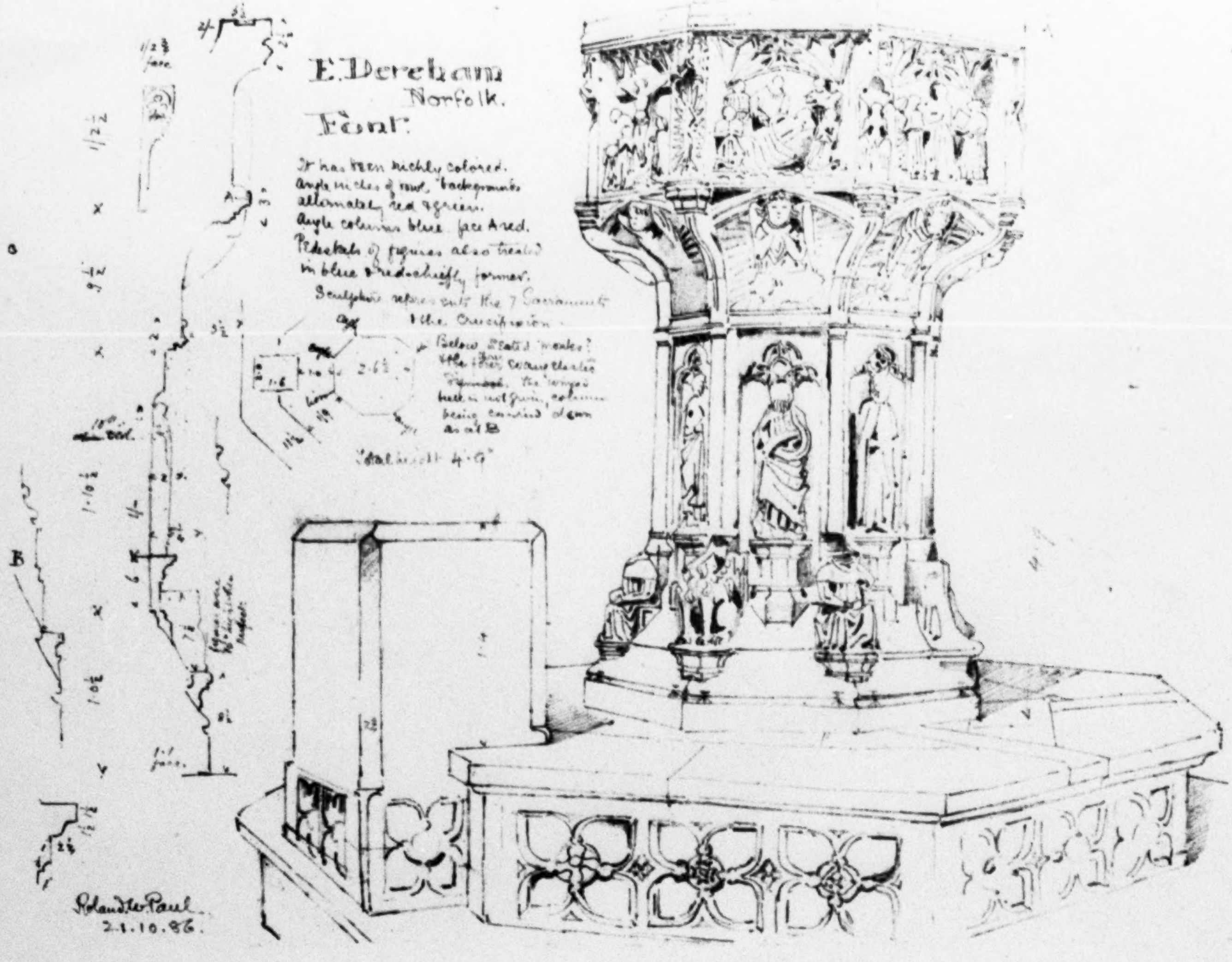


PHOTO LITHO. SPRAGUE & CO. 22, MARTINS LANE CANNON ST. LONDON, E.C.

ST. SAVIOURS UNION INFIRMARY, CHAMPION HILL, S.E.—Messrs. Henry Jarvis & Son, Architects.

ST. SAVIOURS UNION INFIRMARY, CHAMPION HILL, S.E.—MESSRS. HENRY JARVIS & SON, ARCHITECTS.



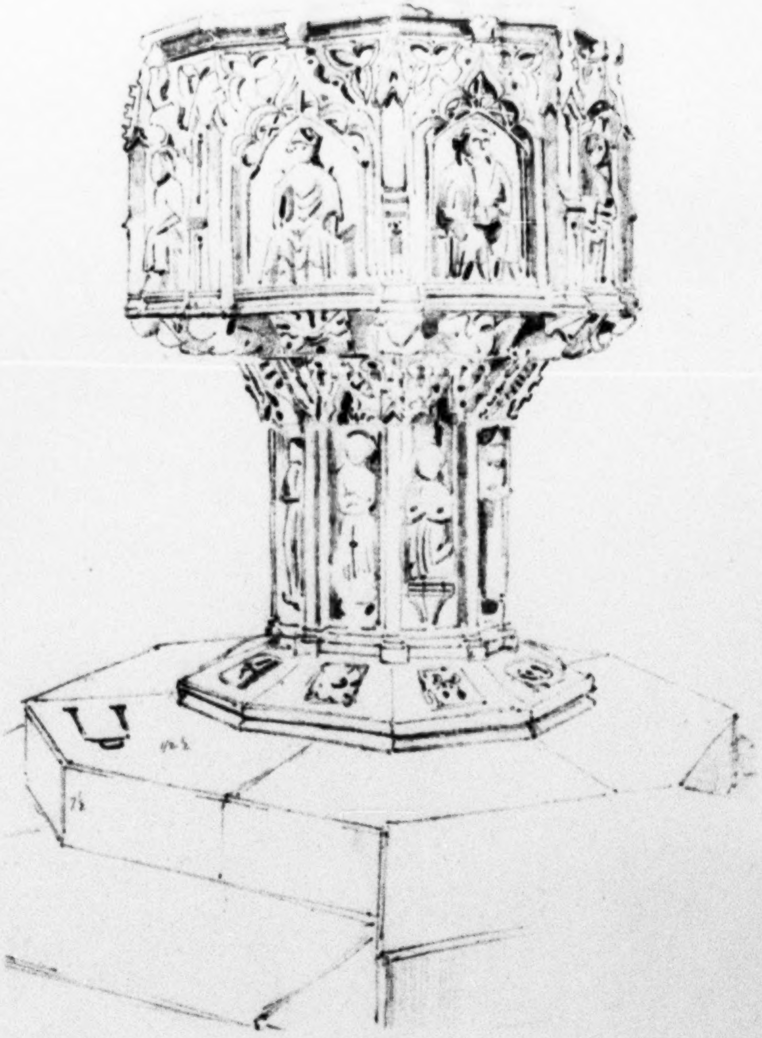
E. Dereham
Norfolk.
Font.

It has been richly colored.
Angle niches of nave, backgrounds
alternately red & green.
Angle columns blue, face & red.
Pedestals of figures also treated
in blue & red, chiefly former.
Sculpture represents the 7 Sacraments
& the Crucifixion.

Below stated 'weaker'? the four corner clusters [illegible]. The 'tongue' hath not given, columns being carried down as at B

Total height 4·9

Roland W. Paul
21.10.86.



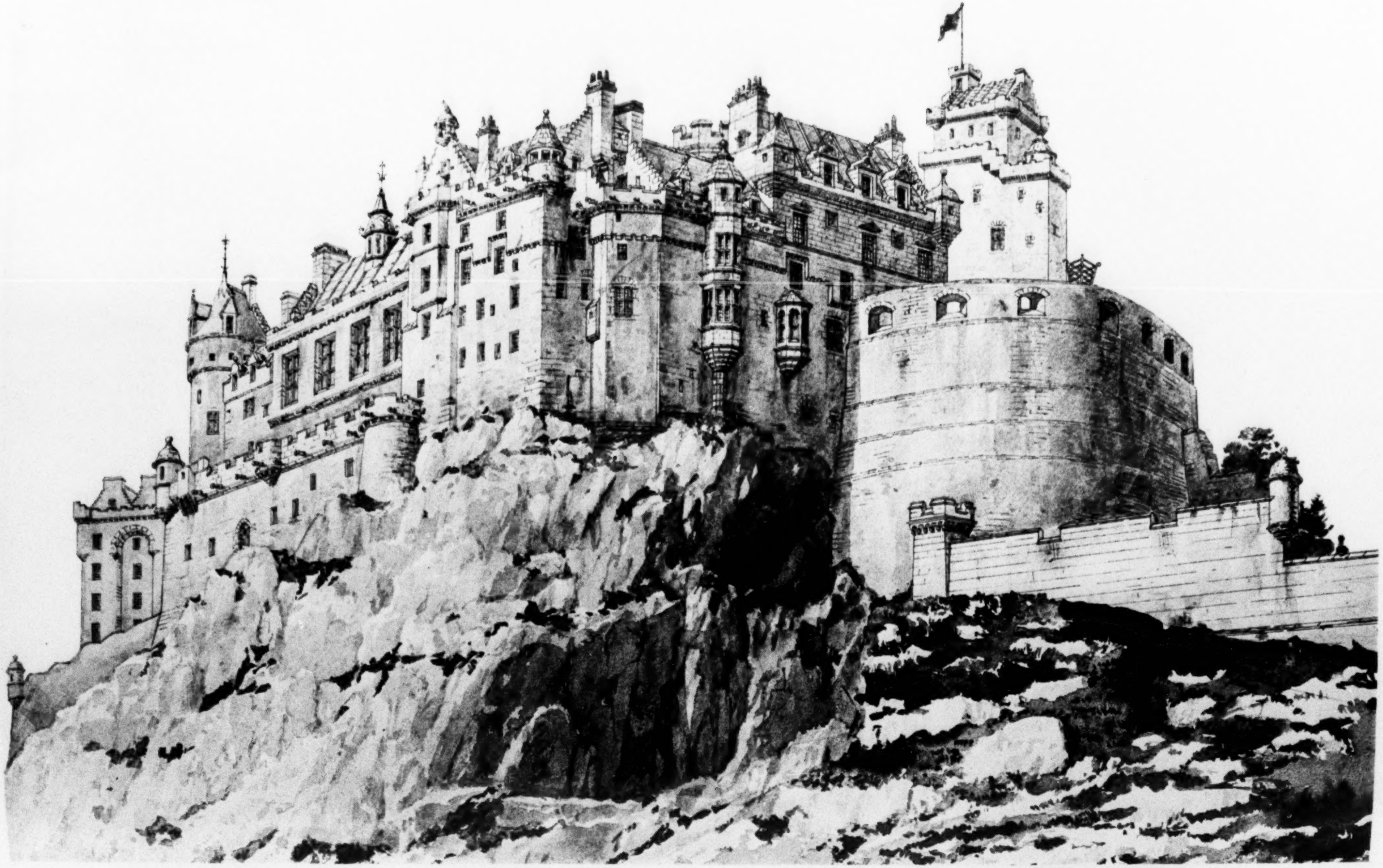
Note: The font is constructed of sandstone
& the carving is all very much worn.

Leverington
Cambridgeshire.
Font.
Roland W. Paul 27.10.86.

INK PHOTO. SPRAGUE & CO. 22, MARTIN'S LANE, CANNON ST. LONDON, E.C.

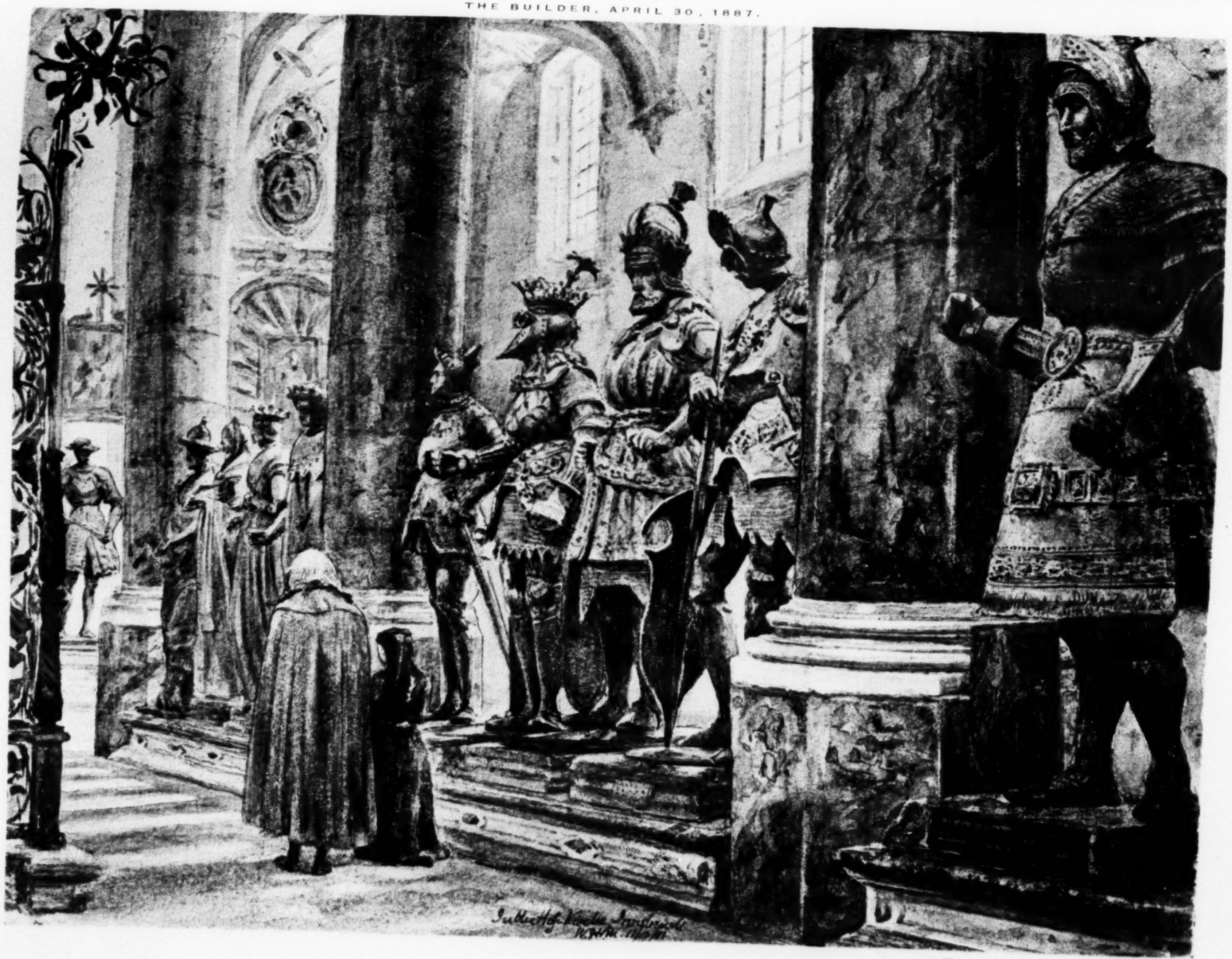
See Article on "Some Norfolk Fonts."

See Article on "Some Norfolk Fonts."



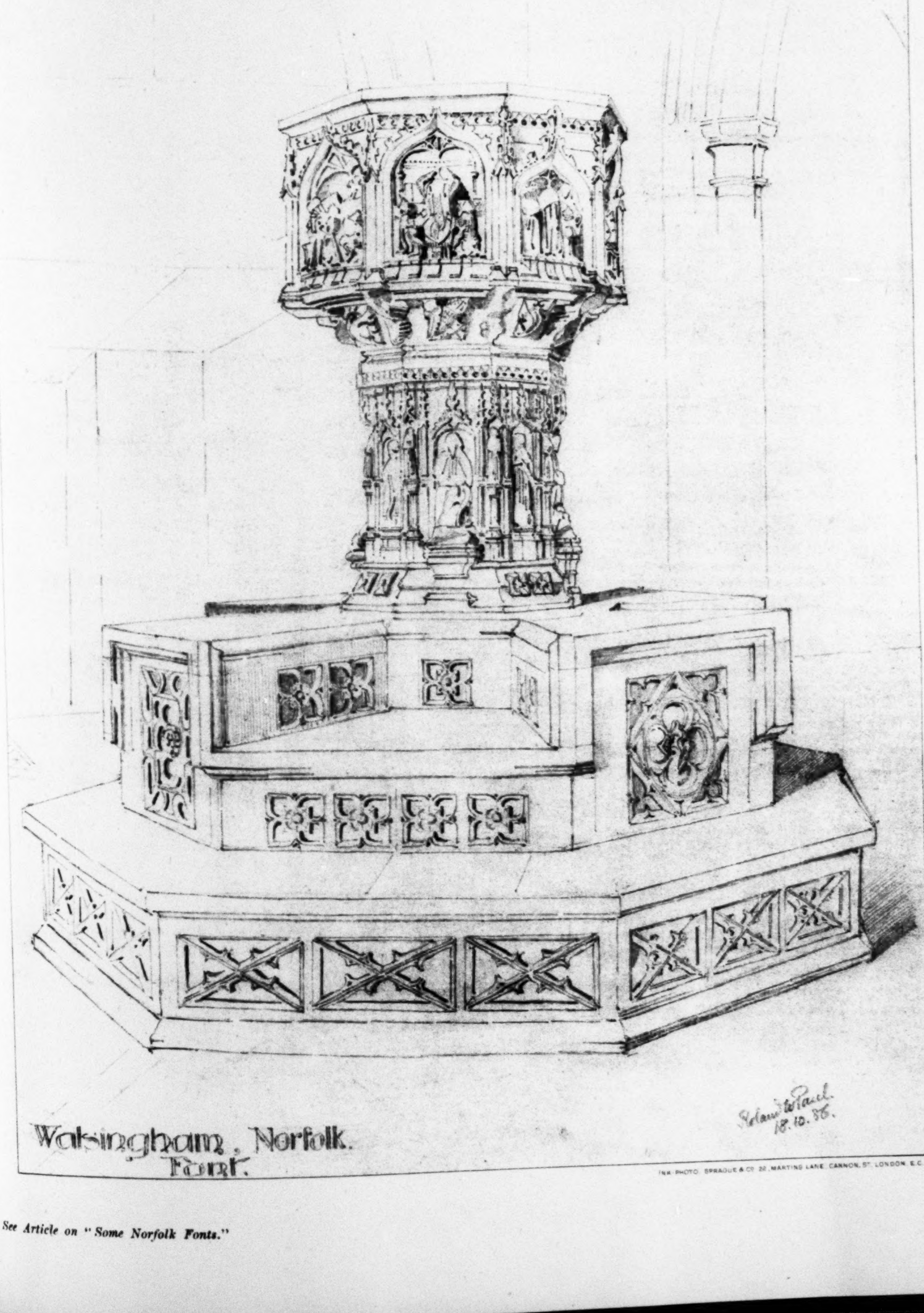
The Phototype Co., 306, Strand, London.

A RESTORATION OF EDINBURGH CASTLE. From a Drawing by Mr. Walter F. Lyon, F.R.I.B.A.


Hof. Kirche Innsbruck
W.J.N.M.

The Phototype Co., 308, Strand, London.

THE BRONZE FIGURES ROUND THE TOMB OF THE EMPEROR MAXIMILIAN AT INNSBRUCK.
From a Sketch by Mr. W. J. N. Millard, A.R.I.B.A.


Roland W Paul
18.10.86.

Walsingham, Norfolk.
Font.

INK-PHOTO. SPRAGUE & CO. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

See Article on "Some Norfolk Fonts."

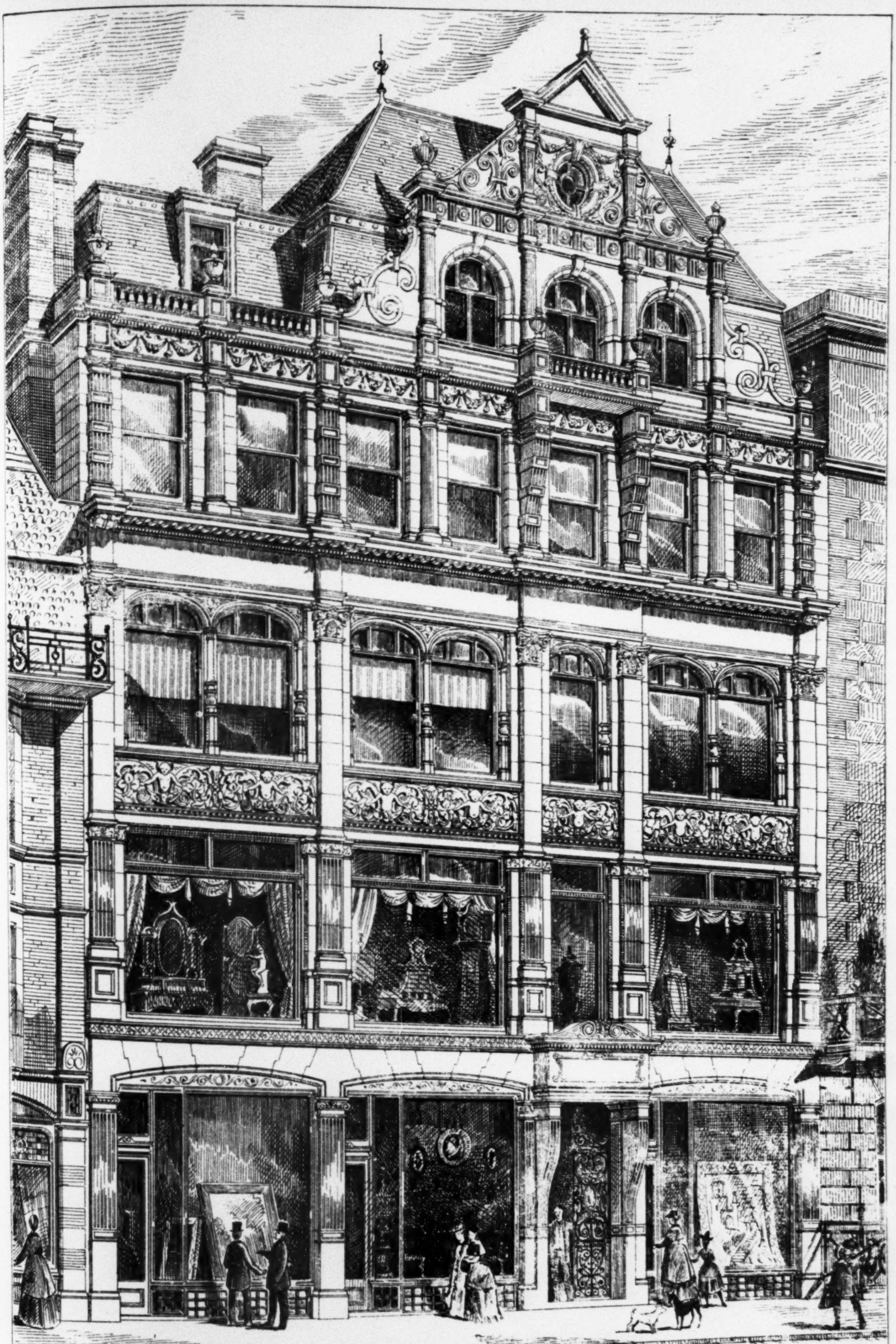


PHOTO-LITHO. SPRAGUE & Co. 22 MARTINS LANE CANNON St. LONDON E.C.

PREMISES IN BROOK STREET.—Messrs. Joseph & Smithem, Architects,

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

REPORT OF THE COUNCIL.

THE Report of the Council, to be submitted to the Annual General Meeting on Monday next, contains the following passages:—

The official year, which terminates with the Annual General Meeting of 1887, may fairly be reckoned one of the most important in the annals of the Institute. Such were the words used, except in the matter of date, in the Report to the Annual General Meeting of 1877, with respect to the measures taken at that time for the improvement of the Institute. The recommendations made by the two Improvement Committees which sat prior to May, 1877, were, however, restricted in their aim by certain provisions of the Charter of 1837. Such obstacles to extension and development are now removed by the grant from her Majesty in Council of a Supplemental Charter, and the issue of Letters Patent under the Great Seal, bearing date the 28th of March, 1887. The document, which is printed as it was received from the Home Office in the current No. (13) of the Journal of Proceedings, is now in the possession of the Corporate Body.* But until the new By-laws to be made under its provisions have been adopted by the Fellows, and submitted to and approved by the Privy Council, the Institute is to be administered in conformity in all respects with the Original Charter and the By-laws now in force. The Council have therefore given notice of their desire to receive from members suggestions for altering or amending certain of the existing By-laws, prior to calling a Special General Meeting. Meanwhile they beg leave, on behalf of the Royal Institute, to express their high sense of the increased privileges and obligations conferred on the Corporate Body by the Queen in Council, and their thanks to the seven architectural societies who supported the petition.

In the Report of 1876-77 the Council congratulated the members on the maintenance of the rate of increase in the classes of Fellow and Associate, and they stated that during that official year twenty-eight Fellows and twenty-four Associates had been elected,—a larger number than had been admitted for many years past. At that time there was no Examination test for the admission of Associates,—a test which, it might fairly have been assumed, would reduce the numbers of that class of members; but the facts show that, in the long run, no such reduction has resulted. The number of Associates elected during the present official year is thirty-eight,† and a comparison with that of 1876-77, so far as concerns the election of candidates in the class of Associates, gives the following:—

1876-77	1886-87
24	38

A comparison of the total number of professional members in 1877 and 1887 affords equally satisfactory results, viz.:—

	1876-77	1886-87
Fellows............	330‡	431§
Associates	318	680
	648	1111

In the course of the official year, which terminates with the annual meeting in May, twenty-four fellows have been elected, nine of whom were previously members in the class of Associates, thereby making an increase of fifty-three new professional members as against forty-five in 1876-77; and at the present moment there are twenty-eight gentlemen eligible to become candidates for the Associateship.

The losses by death have been considerable. Amongst the Fellows they are:—R. K. Penson, F.S.A., Edward Hughes, George Devey, George Bell, and George Vulliamy, Past Vice-President, the Superintending Architect to the Metropolitan Board of Works. Amongst the Associates:—C. B. Thurston, F.S.A., Lionel T. Waller, George Smith, Oswald Adshead, Thomas Farrer, H. Saxon Snell, and R. A. Fraser. Amongst the Hon. Associates:—E. E. Antrobus, F.S.A., Colonel Morant, R.E., and Major-General Moody, late R.E. Amongst the Hon. Corr. Members:—M. Prosper Morey, of Nancy; H. H. Richardson, of Boston, U.S.A.; and Olivier Rayet, of Paris.

The Council submit statements, divided into Ordinary and Trust Funds, of the Receipts and Disbursements for the year ending December 31st, 1886, signed by Mr. Alexander Graham and Mr. G. Richards Julian, the auditors appointed by the last annual general meeting. [Here follow the revenue accounts and balance-sheets of both funds.]

The special disbursements incidental to the Conference, and the legal and other expenses incurred in connexion with the Supplemental Charter, will have to be partially defrayed out of capital.*

In the course of the official year two Examinations in Architecture have been held in London, one during the week commencing November 22nd, 1886, the other during the week commencing March 21st, 1887. Thirteen applicants were admitted to the November Examination, eight of whom passed; and four were relegated to their studies, with the privilege of again presenting themselves without fee. This being the third and concluding Examination of the year 1886, the Board considered the several claims to the Ashpitel Prize of the thirty-nine gentlemen who passed at the Examinations in London and Leeds; and awarded it to Mr. Henry Thomas Hare, of 3, Regent's Park-villas, Gloucester-road, N.W. Thirty-two applicants were admitted to the March (1887) Examination. The examiners who set the questions and assigned the marks were Messrs. H. D. Appleton, S. Flint Clarkson, Alexander Graham, E. A. Gruning, J. D. Mathews, E. C. Robins, John Slater, Ernest Turner, and Aston Webb. The moderators who superintended the written and graphic portions of the Examination were seven in number, namely, Messrs. G. Hamilton Gordon, F. Hooper, J. M. Kennard, W. R. Low, W. Millard, Walter L. Spiers, and C. J. Tait. The Oral Examination lasted two entire days. The Board reported that twenty-five had passed, and that three had not passed; while three were relegated to their studies for one year. Lastly, the Council have required one candidate to present himself again for examination in sanitary science, strength of materials, shoring, &c.

An Examination for Certificates of Competency granted under the Metropolitan Building Act, 1855, and other Acts of Parliament, was held on the 28th and 29th of October, 1886, when nine candidates presented themselves, of whom six obtained Certificates of Competency to act as District Surveyor in London, and one as Building Surveyor under local authorities. Another Examination will take place this month (April).

The report of the Library Management Committee says that:—

> "During the twelve months elapsed from 1st April, 1886, to 31st March of the present year, the total additions to the Library amounted to 244 volumes and 124 pamphlets, and to the Loan Collection 12 volumes and 3 pamphlets, exclusive of periodicals, reports, and transactions of societies, and parts of works issued in a serial form. The number of volumes presented to the Library was 224, and to the Loan Collection 5. Of pamphlets, 123 were presented to the Library and 3 to the Loan Collection. The valuable bequest of the late Mr. Fergusson, Past Vice-President, of such of the architectural works in his library as were not already in the Library of the Institute, brought to the Library an accession of 138 volumes and 3 pamphlets, which are included in the foregoing enumeration. Of drawings, engravings, and photographs, 166 sheets were presented, exclusive of the 'Sketch-Book' of the Architectural Association. The other donations included several specimens of timber, and a medal struck by the Corporation of the City of London.
>
> The works purchased comprise 20 volumes and 1 pamphlet for the Library and 7 volumes for the Loan Collection, together with several Parliamentary papers.
>
> The want of shelf-space in the Library has been temporarily met by the erection of a new bookcase; but, while recognising this help, it must be pointed out that it cannot be regarded save as tiding over an immediate and pressing difficulty, and that the question of further accommodation for books will before long again have to be taken up. The Committee reported to the Council on a scheme for providing shelving for books of reference in the meeting-room, to be left open for readers. This scheme was referred back by the Council for reconsideration. The new bookcase will enable some shelves in the meeting-room to be cleared out for the above purpose.
>
> The attendances of readers in the Library were close upon 3,000, details of which are given in a tabular form in an appendix. The day attendances show an increase of more than 26 per cent., and the evening attendances an increase of more than 3½ per cent., as compared with those of last year.
>
> The number of fresh tickets (exclusive of renewals) issued for admission to the use of the Library and Loan Collection was 84, an increase of more than 9 per cent. upon that of last year. The number of volumes issued on loan was 910."

The new series of the Journal of Proceedings has, in its third volume, assumed a literary character. On the recommendation of the Standing Committee for Literature, the Council have admitted into the Journal contributions of varied description from members, under the heads of "Sessional Notes," of "Members' Memoranda" on the papers read at the ordinary meetings, and of "Correspondence." The several books, drawings, &c., presented by members and others, have also been separately noticed, and in some cases have been carefully reviewed; while, from the foreign periodicals and the Bulletins of Societies, matter has been obtained for "Foreign Notes," written for the most part by members of the Literature Committee. Indeed, the Council feel that they are greatly indebted to the already large number of contributors to the Journal, and especially to Mr. Alexander Graham, who, as Vice-chairman of the Literature Committee, has taken the greatest interest in the work. Mr. Roger T. Conder, one of the Hon. Secretaries of the Committee, has also regularly assisted on the Wednesdays preceding the day of issue, generally until a late hour of the night. Eight meetings of the Literature Standing Committee* have been held, and the work of procuring papers for reading and discussion has been materially aided by the energy of Mr. G. Richards Julian, the senior Hon. Secretary of the Committee.

The Standing Committees for Art and for Practice have also met regularly about once a month, and three meetings of the Standing Committee for Science have been held. The memoranda and business of the Special Light and Air Committee have been taken over by the last-named, and, besides other matters of importance, they have commenced an inquiry into the subject of "Rot in Timber."

The business of the original Committee for the Conservation of Ancient Monuments has been taken over by the Standing Committee for Art, and they have brought up careful reports respecting well-known buildings of historical and artistic interest. They have considered a scheme, drawn by Mr. E. J. Tarver, one of the Hon. Secretaries of the Committee, for the improvement, at its southern opening, of the new street from Charing-cross to Tottenham Court-road. On their recommendation, the Council addressed a letter to the Metropolitan Board of Works, and submitted a plan for amending the line of the new street in the eastern frontage of the National Gallery, and for joining the triangular plot at the back, containing a public-house still standing, to the National Gallery, thus absorbing the east end of Hemming's-row. A proposal made by the Fine Art Committee of the Royal Commission for the Adelaide Jubilee Exhibition,—that the Institute should collect and send out, at its own expense, a certain number of photographs of executed works, taken from the buildings themselves,—was delegated to the Art Standing Committee to carry out; and owing to the exertions of Mr. Ralph Nevill, F.S.A., the other Hon. Secretary of the Committee, about 100 photographs were got together. An exhibition of the photographs, which were contributed by thirty-two members of the Institute and others, was held in the Arbitration Room, during the greater part of a week, and the collection is now on its way to Adelaide.

The Standing Committee for Practice have been actively engaged in arranging the preliminaries of an inquiry into points connected with the Metropolitan and Provincial Building Acts, and they are considering the "Heads of Builders' Contracts" now in use. The Hon. Secretaries, Mr. T. M. Rickman, F.S.A., and Mr. E. T. Hall, have further collated, from the Minutes of the Institute, particulars of the several suggestions for Professional Practice, Declarations, &c., made from time to time during a number of years, with other items of information, for the use of the Committee.

The Competitions Committee reported in

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* We also reprint it in the *Builder* this week.

† Except in the period of four years between 1878 and 1882, when the Obligatory Examination came into force, this is the largest number of Associates admitted in the course of twelve months. During the decade preceding 1878, the largest number of Associates elected in one year was 32, the lowest 14.

‡ Including 46 Life Members.

§ Including 35 Life Members.

* The portion of capital now held in Consols, which, at the beginning of 1881, after the cost of the building alterations had been met, was £1,760l. 17s. 9d., has reached the sum of 4,075l.

* The four Standing Committees met early in the official year to appoint their officers. The Art Committee called Mr. Aitchison to the chair, and Colonel Edis became vice-chairman. The Literature Committee appointed Mr. Blomfield chairman, and Mr. Graham vice-chairman. For Practice, Mr. Currey was made chairman, and Mr. Cates vice-chairman. For Science, Mr. Worthington was chairman, and Mr. Charles Fowler vice-chairman. The names of the Hon. Secretaries of these Committees, two to each are given in the text of the report.

August last, and brought up comparative "Analyses" of Architectural Competitions from January, 1882, to December, 1883, and from January, 1884, to December, 1885, which were published in the Journal of Proceedings (vol. ii., p. 203). The Committee promise another Report at the close of the present Session.

Since the issue of the last Report, the Council have held twenty-three meetings, and Committees of the Council for Special Purposes have met as occasion required.

The Classes of Masonry, conducted by Mr. Lawrence Harvey, Associate, at the City and Guilds Central Institution (South Kensington), have been the means of reviving an important branch of architectural study hitherto much neglected in this country. Mr. Harvey has furnished monthly reports of the work done by himself and the students he has ably guided. At his request, a deputation of the Council, consisting of the President, of Mr. Aitchison, Mr. Barry, Mr. Cates, and others, attended the final meeting of the classes, and expressed warm approval of Mr. Harvey's exertions.

Two Special Committees, whose appointment was announced in the last Report of the Council, have been busily occupied during the official year. The Education Committee have accumulated a large amount of information, and have deputed to a Sub-Committee the task of considering the best means by which the Institute Prizes can be made to serve a more educational purpose than they do at present; but as the whole subject is a large one, the Committee are unable to report at present, and they have consequently requested that they may be re-appointed for the ensuing year. The Report of the Federation Committee is to form a subject for discussion at an afternoon meeting of the General Conference of Architects about to be held.

THE SUPPLEMENTAL CHARTER.

As stated in the foregoing report, the new Supplemental Charter, as drafted, has undergone, at the hands of the Law Officers of the Crown, some modifications. These are thus described in an official "Note" in the last number of the "Journal of Proceedings": In Clause 22, instead of "the whole property . . . . shall *vest in* the Royal Institute," the words "shall *be conveyed by the persons in whom the same is now vested to* "the Royal Institute," have been substituted. To Clauses 23 and 24, the words "*after complying with all requisites from time to time required by law in that behalf*" have been added. In Clause 25, the words "No non-subscribing member, &c.," have been altered to "No *person who shall hereafter become a* non-subscribing member." Lastly, Clause 33 has received an addition whereby all By-laws must be submitted for approval to the Lords of the Privy Council.

The Supplemental Charter is here given in its entirety:—

"Victoria, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen Defender of the Faith. To all to whom these presents shall come greeting. Whereas Thomas Philip Earl de Grey did by a Petition to His Majesty King William the Fourth humbly represent among other things that he and divers others had associated together for the purpose of forming an Institution for the general advancement of Civil Architecture, and for promoting and facilitating the acquirement of the knowledge of the various arts and sciences connected therewith, it being an art esteemed and encouraged in all enlightened nations as tending greatly to promote the domestic convenience of citizens, and the public improvement and embellishment of towns and cities. And whereas His said Majesty being desirous of encouraging a design so laudable and salutary did by a Royal Charter of Incorporation (hereinafter called the Original Charter) dated eleventh day of January One thousand eight hundred and thirty seven and given by Writ of Privy Seal grant and declare that the said Thomas Philip Earl de Grey and such other persons who were then members of the Society therein mentioned or who should at any time afterwards become members thereof should form one Body Politic and Corporate for the purposes recited in the said Charter by the name of The Institute of British Architects with perpetual succession and a common seal with full power and authority to alter vary break and renew the same at its discretion and by the same name to sue and be sued implead and be impleaded answer and be answered unto in every Royal Court and be for ever able and capable in the law to purchase receive possess and enjoy to it and its successors any goods and chattels whatsoever and also be able and capable in the law (notwithstanding the Statutes of Mortmain) to take purchase possess hold and enjoy to it and its successors a Hall and any messuages lands tenements or hereditaments whatsoever the yearly value of which including the site of the said Hall should not exceed in the whole the sum of Two thousand pounds computing the same respectively at the rack rent which might have been had or gotten for the same respectively at the time of the purchase or acquisition thereof and to act in all the concerns of the said Body Politic and Corporate for the purposes aforesaid as fully and effectually to all intents effects constructions and purposes whatsoever as any other of the liege Subjects of the Crown or any other Body Politic or Corporate in the United Kingdom of Great Britain and Ireland not being under any disability might do in their respective concerns. And whereas His said Majesty did thereby grant especial license and authority unto all and every person and persons bodies politic and corporate (otherwise competent) to grant sell alien and convey in Mortmain unto and to the use of the said Society and its successors any messuages lands tenements or hereditaments not exceeding such annual value as aforesaid. And whereas the Original Charter contained further provisions for the constitution and management of the said Institute and its affairs. And whereas on the eighth day of August One thousand eight hundred and thirty seven in the first year of our reign We graciously consented to become the Patron of the said Institute and did afterwards grant and do annually grant and confer at the recommendation of the said Institute a Royal Gold Medal for the promotion of Architecture. And whereas on the eighteenth day of May One thousand eight hundred and sixty six We were graciously pleased to command that the said Institute should thenceforth be styled The Royal Institute of British Architects (hereinafter called the Royal Institute). And whereas a humble Petition has been presented to Us on behalf of the said Royal Institute setting forth among other things that it is expedient to amend the provisions of the Original Charter to the effect and in the manner hereinafter expressed and that such further powers and privileges should be granted to the Royal Institute as are hereinafter contained. Now therefore We having taken the said Petition into Our Royal consideration and being desirous of furthering the gracious intent of Our Royal Predecessor and of promoting the advancement of the interests of the Royal Institute have willed granted and declared and We by Our Prerogative Royal and of Our especial grace certain knowledge and mere motion by these Presents for Us and Our Royal Successors do will grant declare and ordain as follows (that is to say):—

I. *Transition.*

1. The Royal Institute and the property thereof shall be administered in conformity in all respects with the Original Charter and the Bye-laws in force at the date of this Our Charter until the Bye-laws to be prepared as ordained by this Our Charter shall have been adopted by the Royal Institute as hereinafter provided. When and as soon as the said Bye-laws have been adopted as aforesaid the provisions of the Original Charter which are described in the Schedule to this Our Charter and the Bye-laws in force at the date of this Our Charter shall be repealed and the Royal Institute and the property thereof shall be thenceforth administered in conformity in all respects with this Our Charter and the Bye-laws made or to be made thereunder.

II. *Classes and Qualifications of Members, &c.*

2. The Royal Institute shall consist of three classes of subscribing Members, namely, Fellows, Associates and Honorary Associates, and two classes of non-subscribing Members, namely, Honorary Fellows and Honorary Corresponding Members, and such other classes either subscribing or non-subscribing as may be hereafter established by the Royal Institute.

3. Fellows shall be Architects who have attained the age of thirty years and who have been engaged as principals for at least seven successive years in the practice of Architecture. After the expiration of five years from the date of this Our Charter the Royal Institute shall have power to declare that every person desiring to be admitted a Fellow shall be required to have passed such Examination or Examinations as may be directed by the Royal Institute. But in special cases the Council shall have power to dispense with such Examination or Examinations.

4. Associates shall be persons engaged in the study or practice of Architecture who have attained the age of twenty-one years. From the date of this Our Charter every person desiring to be admitted an Associate shall be required to pass or to have passed such Examination or Examinations as may be directed by the Royal Institute.

5. Honorary Associates shall be persons not professionally engaged in practice as Architects who by reason of their position or of their eminence in art science or literature or their experience in matters relating to Architecture may appear to the Council to be able to render assistance in promoting the objects of the Royal Institute.

6. Honorary Fellows shall be Members of the Royal Family, persons who hold or have held high office in the Government of the United Kingdom or of India or of any Colony or Dependency of the United Kingdom and other illustrious or distinguished persons to be selected as the Royal Institute may from time to time determine.

7. Honorary Corresponding Members shall be persons not being British Subjects and not residing within the United Kingdom nor practising as Architects in India or in any Colony or Dependency of the United Kingdom who by reason of their eminence as Architects or as Archæologists or for artistic scientific or literary acquirements may appear to the Council able to render assistance in promoting the objects of the Royal Institute.

8. The Council shall have power to decide conclusively respecting the admission as a Candidate for election of each person proposed as a Member of the Royal Institute.

9. Every Fellow and every Associate and such other subscribing Members as the Royal Institute may hereafter determine shall be entitled to obtain a Certificate of Membership subject to such conditions and on payment of such subscriptions or other sums as Bye-laws may from time to time prescribe, and any such person ceasing to be a Member shall on demand deliver back to the Council his Certificate of Membership.

10. A Fellow may use after his name the initials F.R.I.B.A. and an Associate the initials A.R.I.B.A.

III. *President, Vice Presidents, &c.*

11. There shall be a President and Vice-Presidents and one or more Honorary Secretaries of the Royal Institute.

12. The President shall be elected from the class of Fellows or from the class of Honorary Fellows.

13. The Vice-Presidents and the one or more Honorary Secretaries shall be elected from the class of Fellows.

IV. *Council.*

14. There shall always be a Council of the Royal Institute which Council shall consist of the President, the Vice-Presidents, the one or more Honorary Secretaries and of other Members to be elected at a General Meeting of the Royal Institute in such manner and at such times as Bye-laws may from time to time prescribe.

15. The Council may regulate their own proceedings by Standing Orders or otherwise as they may see fit and any act or proceeding of the Council shall not be invalidated by any vacancy in the Council provided always that the number of Members of Council be not reduced below one-half of the full number prescribed by the Bye-laws.

16. The Council shall subject to such limitations or restrictions as Bye-laws may from time to time prescribe have the sole management of the income of the Royal Institute and also the entire management and superintendence of all the other affairs and concerns thereof and the exclusive right of nominating such Officers and servants as they may deem necessary or useful to the Royal Institute and of removing them if they shall think fit and shall prescribe their respective duties salaries or remuneration.

17. The Council may subject to such limitations or restrictions as Bye-laws may from time to time prescribe apply the Funds of the Royal Institute in furthering professional education and in conducting all Examinations which the Royal Institute may hold under the authority of this Our Charter or which the Royal Institute now or is or may hereafter be empowered or required by Statute to hold and such other Examination or Examinations as the Royal Institute may from time to time think fit to establish and in extending and improving the Library Museum and Collections and for other purposes connected with Architecture and in otherwise promoting the objects of the Royal Institute.

18. The Council may regulate and determine the fees to be paid by candidates in respect of all Examinations which the Royal Institute may hold under the authority of this Our Charter, or which the Royal Institute now is or may hereafter be empowered or required by Statute to hold, and such other Examination or Examinations as the Royal Institute may, from time to time, think fit to establish.

19. The Council may apply any donations or endowments which have been or may be given to the Royal Institute for any benevolent purposes connected with the profession of Architecture.

V. *Examinations.*

20. Examinations, by or under this Our Charter or which the Royal Institute now is or may hereafter be empowered or required by Statute to hold and such other Examination or Examinations as the Royal Institute may, from time to time, think fit to establish shall be held at such times and places within the United Kingdom or India or any Colony or Dependency of the United Kingdom and in such manner as the Council may from time to time determine.

21. The Royal Institute shall have power to grant such Diplomas or Certificates in connexion with Examinations or otherwise in such manner as Bye-laws may from time to time prescribe.

VI. *Property.*

22. As soon as the Bye-laws have been adopted as hereinbefore provided the whole property of the Royal Institute shall be conveyed by the persons in whom the same is now vested to the Royal Institute and the power and authority to sell alienate charge vary or otherwise to dispose of the same or any part

thereof shall subject to the previous sanction of a Resolution of a General Meeting confirmed at a subsequent General Meeting held not less than seven and not more than twenty-eight days after the former Meeting thenceforth be exercisable by the Council who shall have the management and superintendence of the said property.

23. The Royal Institute may after complying with all requisites from time to time required by law in that behalf receive and hold any donations or endowments consisting of property of any description real personal or mixed for the general purposes of the Royal Institute and may also receive donations or endowments for Prizes Medals Exhibitions Studentships or Scholarships or for any special objects connected with the Royal Institute which shall not be inconsistent with the provisions of the Original Charter as amended by this Our Charter.

24. The Royal Institute may after complying with all requisites from time to time required by law in that behalf receive and hold any donations or endowments consisting of property of any description real personal or mixed which have been or may be given for any benevolent purposes connected with Architecture.

25. No person who shall hereafter become a non-subscribing Member shall in any case or at any time nor shall any person who shall hereafter become a subscribing Member and shall afterwards cease from any cause whatever to be a Member or any of their representatives have any interest in or claim against the property of the Royal Institute.

VII. *General Meetings.*

26. General Meetings of the Royal Institute including such as may be summoned by the Council on the requisition of Members or otherwise shall be held as Bye-laws may from time to time prescribe and at least one General Meeting shall be held in every year.

27. At General Meetings Fellows shall be entitled to be present and to take part in the discussions on any subject brought before the Meetings and to vote at such Meetings.

28. At General Meetings Associates shall be entitled to be present and to take part in the discussions on any subject brought before the Meetings, and to vote at such Meetings, provided always that no Associate shall be entitled to vote in respect of the making and adopting altering revising suspending or rescinding of any Bye-law.

29. At General Meetings Honorary Associates shall be entitled to be present and to take part in the discussions on any subject brought before the Meetings and subject to such limitations or restrictions as Bye-laws may from time to time prescribe to vote at such Meetings provided always that no Honorary Associate shall be entitled to vote in respect of the making and adopting altering revising suspending or rescinding of any Bye-law.

30. At General Meetings Honorary Fellows shall be entitled to be present and to take part in the discussions on any subject brought before the Meetings but unless holding the office of President shall not be entitled to vote.

31. At General Meetings Honorary Corresponding Members shall be entitled to be present and to take part in the discussions on any subject brought before the Meetings but shall not be entitled to vote.

32. At General Meetings any Resolution adopted by such a majority as Bye-laws may from time to time prescribe of those Members having a right to vote and voting at such Meetings shall be deemed and is hereby declared to be a Resolution of the Royal Institute. In the case of an equality of numbers the person presiding shall have a second or casting vote.

VIII. *Bye-Laws and Interpretation.*

33. The Royal Institute may from time to time by resolution of a General Meeting confirmed at a subsequent General Meeting which shall be held not less than seven and not more than twenty-eight days after the former Meeting make and adopt such Bye-laws as may be deemed expedient and may in the same manner vary suspend and rescind any Bye-laws and make and adopt others in their stead but so that the Bye-laws for the time being be not in any respect repugnant to the law of England or inconsistent with this Our Charter. Provided always that no such Bye-laws shall be of any force or validity whatever unless and until they have been approved by the Lords of our Most Honourable Privy Council.

34. Subject to the provisions of this Our Charter Bye-laws shall define regulate and prescribe

(*a*) The conditions of Membership and the mode of election and admission and the privileges obligations and benefits of the several classes of members of the Royal Institute and the payments to be made by members.

(*b*) The cases and manner in which a member of the Royal Institute may be excluded or suspended from membership.

(*c*) The mode time and place of summoning and adjourning General Meetings whether Ordinary Business Special Annual or otherwise and the quorum for and the mode of voting at such Meetings whether in person or by proxy or by ballot or by voting papers or otherwise and the number of Votes which shall form an effective majority at such meetings and the conduct of proceedings thereat.

(*d*) The qualification and mode of election of the President and the number qualification and mode of election of the Vice-Presidents and of the one or more Honorary Secretaries and the number qualification and mode of election of the other members of the Council and their respective tenures of office and the mode of filling casual vacancies in the Council and the quorum for Meetings of the Council.

(*e*) The mode of election tenure of office and duties of two Auditors of the Accounts of the Royal Institute.

(*f*) The appointment of Standing Committees and the proceedings thereof.

(*g*) The terms and conditions for such Prizes Medals Exhibitions Studentships or Scholarships as have been or may from time to time be established by the Royal Institute.

(*h*) The relations of the Royal Institute to such branches thereof as may be established within the United Kingdom or India or any Colony or Dependency of the United Kingdom and to other Societies having kindred aims and purposes.

35. In this Our Charter the expression 'the Council' means the Council of the Royal Institute, and the expression 'the United Kingdom' includes the Channel Islands and the Isle of Man.

And We do also further will and ordain that subject to the provisions contained in this Our Charter, the Original Charter shall be so far as unrepealed have full effect and validity and We do hereby confirm the same accordingly.

In witness whereof We have caused these Our Letters to be made Patent Witness Ourself at Westminster the Twenty-eighth day of March in the fiftieth year of Our Reign.

Schedule referred to in Sect. I., Clause 1.

The portions of the Original Charter repealed are—From Section Three beginning with the words '*And our will and pleasure is and We further grant and declare that the Institute of British Architects*' to the end of Section Ten which ends with the words '*construction and purposes whatsoever.*'

By Warrant under the Queen's Sign Manual,

Muir Mackenzie."

[Here follows copy of the Great Seal.]

WATER SUPPLY FROM WELLS.

INSTITUTION OF CIVIL ENGINEERS.

At the meeting of this Institution on Tuesday, the 19th of April, Mr. Edward Woods, President, in the chair, four papers were read on the subject of obtaining water-supply from wells, namely, "Chalk Springs in the London Basin," by Mr. J. W. Grover, M. Inst. C.E.; "Borings in the Chalk at Bushey, Herts," by Mr. William Fox, M. Inst. C.E.; "On a Bore-hole in Leicestershire," by Mr. T. S. Stooke, Assoc. M. Inst. C.E.; and "The Wells and Borings of the Southampton Waterworks," by Mr. William Matthews, Assoc. M. Inst. C.E.

In the first paper, Mr. Grover began by pointing out what a large and rapidly-increasing water-supply was required for London, and that the Upper and Lower Greensands did not yield water in any quantity, and therefore were not available, as Professor Prestwich had hoped, for furnishing a supplemental source of supply for the metropolis. He showed that the Chalk was the true source, but that care must be exercised in selecting a site for sinking a well into it; and that whilst only a moderate supply of water could be obtained where the Chalk was overlaid with a thick bed of clay, owing to the compression of the fissures by the superincumbent weight, and the distance the water had to travel underground, a large supply might be secured by sinking a well at the outcrop of the Chalk, at a point near a river, which indicated a subterranean flow of water. Consequently there was no prospect that any large volume of water could be obtained from the Chalk under London, or from the Upper or Lower Greensands, owing to the immense pressure upon them. The author then proceeded to describe in detail the various works carried out for supplying the Newbury, Wokingham, Leatherhead, and Rickmansworth districts with water. A plentiful supply was readily obtained for the Newbury district by sinking a 7-ft. well, 13 ft. deep, in the valley of the Kennet, on the west side of the town. The chalk-spring struck there proved of excellent quality, and the water was raised by pumps into two reservoirs, at a high level, each having a capacity of 110,000 gallons, and commanding the whole of the town. The cost of the works had not exceeded 20,000*l*. Two wells had been previously sunk in the Wokingham district to depths of 366 ft. to 734 ft., through the Bagshot Sands, London Clay, and Woolwich and Reading Beds, into the Chalk, which failed to give an adequate supply of water, owing, in the author's opinion, to the flowing in of the fine running sand of the Woolwich and Reading Beds. By sinking another well down into the Chalk, which was reached at a depth of 345 ft., and carefully excluding the fine sands of the Woolwich and Reading Beds in its descent, a fide chalk-spring was struck at 405 ft., which rose to 30 ft. from the surface. The well was sunk in twelve months; and several trials were made of the yield of the well, which proved that the spring flowed more freely after pumping, owing, doubtless, to the fissures giving passage to the water being cleared out and enlarged. A lower set of pumps drew the water from 123 ft. below the surface. The upper pumps, capable of pumping 10,000 gallons an hour, lifted the water into reservoirs 144 ft. above the engine-house floor, having a capacity of 220,000 gallons; and a constant service was afforded at a capital cost of under 20,000*l*. The Leatherhead district included eight parishes in Surrey, having an area of 24 square miles; but it would be possible to extend its limits, and to afford a supplemental supply to South London from the Leatherhead springs, for which no other at all equally available source of supply existed. A 12-in. boring was sunk to a depth of 200 ft. in the chalk, through flint beds containing powerful Chalk-springs; and the yield of water at the depth reached far exceeded any possible requirements, the flints being continuous for the last 40 ft., and forming a natural reservoir, from which the water rose to the surface when liberated by the bore-hole. The catchment area embraced the whole basin of the Mole above Leatherhead, over 100 square miles in extent; the water in the well kept a level of 2 ft. to 3 ft. above the River Mole, and maintained an even temperature of about 53° all the year round. From trials made with the pumps drawing 15,000 gallons an hour, it appeared that 1,000,000 gallons a day could be raised by the pumps from the surface, and by enlarging the borehole down to the great reservoir of flints below the 97-foot level, a minimum daily supply of 4,000,000 to 5,000,000 gallons could probably be obtained. A constant supply was provided from a reservoir, containing 125,000 gallons, the level of which would command South London with a high service. The collecting basin above Rickmansworth was 234 square miles in extent; and the water rose in many places bright and pure from the flint beds in the Chalk. The subterranean flow had been estimated at 70,000,000 a day at Rickmansworth; and from 5,000,000 to 10,000,000 gallons might probably be intercepted. A well was sunk near the River Colne, at a bend in the valley, where the chalk-spring broke out with the greatest volume, to a depth of 300 ft. through Chalk and flint beds. The water rose in the well to a level of about 3 ft. above the adjacent River Colne; and the volume of water obtained from the well was much augmented by enlarging the borehole and further sinking. Trials were made, during the operations, of the effects produced on the water-level by pumping 21,600 gallons an hour, when the water soon regained its original level on stopping the pumps.

Mr. Fox described, in his paper, the works carried out, in the valley of the Colne, for supplying a large district lying between Watford and London. A well and boring were commenced in 1874, and completed in 1876, to a depth of 212 ft., having pierced 20 ft. of hard rock chalk, where it was stopped, owing to no greater supply of water being anticipated from further sinking. Trials of the yield of the well showed that it had decreased from 820,000 gallons in twenty-four hours in 1876, to 650,000 gallons in 1881; but, by lowering the pumps 20 ft., the yield was raised from 900,000 to 1,000,000 gallons, which was found to have been maintained on testing it again in 1885. Observations of the amount of water pumped, the level of the water in the well, and the rainfall, showed that the well and adjacent strata acted as a storage reservoir supplied by the rainfall. In order to increase the supply for an enlarged demand, a new well was sunk, in 1885, down to the Gault, 700 ft. from the surface, at an average rate of 16 ft. a day. No increase of water was obtained in the last 200 ft. The flow of water from the top of the bore-hole, 43 ft. below the surface, into the well had diminished from 656,000 gallons to 555,000 gallons in twenty-four hours, at which rate it flowed steadily. The water in the new well was conveyed through a tunnel into the old well, from which it was pumped. When the communication was closed by a valve, the water-level in the old well was lowered by pumping without affecting the level in the other well, showing that the sources of supply of the two wells were separate. From the results obtained in sinking the new well, it would appear that a much larger supply of water could have been obtained from the old well by sinking the bore-hole 300 ft. more. The supply was now 1,500,000 gallons a day; but some new pumps could be arranged to draw 15 ft. below the present level of the old well; and by lowering the well this amount, and modifying the pumps, the yield could be increased to from 2,000,000 to 3,000,000 gallons a day.

A borehole was sunk, in 1880, to a depth of 754 ft., by the Local Board of Hinckley, in Leicestershire, acting under the advice of Mr. Plant, for seeking a supply of water from the "Waterstones" of the Triassic formation, at the base of the Keuper Marls. The water-line was met with 80 ft. below the surface; and, in 1883, Mr. Stooke advised that pumping should be effected with easily available plant. Boring rods, 3 in. in diameter, and 450 ft. long, served for suction-pipes; and boring-rods, provided with rubbers, were used as pumping-rods to a depth of 300 ft. The pump was worked with a stroke of 18 in.; and 400,000 gallons of water were pumped out of the borehole in April and May, 1883. The water contained about 500 grains of solids, and 40 grains of chlorine, to the gallon. A 3-in. borehole was then carried 51 ft. lower, and gave evidence of more favourable water-bearing strata. A plug was obtained to separate the upper from the lower water, as the tubing had not been carried below 476 ft. from the surface; and the pump was arranged for the plug to act at a depth of 690 ft. The quality of the water, however, was no better, the solids ranging from 425 to 395 grains per gallon. The plug was then placed at a depth of 731 ft., and afterwards as near the base of the original borehole as practicable, without any better quality of water being obtained. On the plug being raised, it did not appear that any water could have passed it; and the water from the upper strata must therefore have passed to the pump through fissures in the rock.

Mr. Matthews, after explaining the hydrographical conditions of the district round Southampton, proceeded to describe the several steps taken to obtain a water supply of 3,000,000 gallons a day for the borough, at a cost of 60,000*l*. A small 3-in. boring was first sunk 105 ft. in the Chalk, just above its outcrop at Otterbourne, where a remarkable convergence of water gradients, as obtained from ninety wells, had been found, with the object of ascertaining the actual presence of water before executing further works. Water was found in the Chalk in good quantity at a depth of 20 ft. Two 12-in. borings were then sunk in eleven days, each 50 ft. from the small boring, and in a line parallel to the outcrop. On pumping continuously from both borings for sixteen days, a mean discharge of 20,960 gallons per hour was obtained with a loss of head of 9 ft. 8 in.; and, on ceasing to pump, the water rose rapidly to its normal level, which is very constant there at all seasons. An adequate yield having thus been proved, the regular works were proceeded with. As the trial borings had been sunk so easily and rapidly by the ordinary "chisel-and-shell" method, the author determined to sink two bored wells, each 6 ft. in diameter, instead of one large well sunk by hand in the usual manner, thereby gaining the advantage of having two independent wells, and saving the cost of temporary pumping-machinery. After executing the foundations of the engine-house, and forming a strong working-floor, the wells were bored, to a depth of 100 ft. from the surface, by breaking up the Chalk and flints by dropping down the iron 3-in. boring rods, furnished with three steel-pointed chisels, and raising the *débris* by the "miser" to the surface. The chisels and the miser were given a rotary motion by manual labour, and the miser usually came up about two-thirds full. The first well was bored in thirty-three days, having been delayed by accidents; but the second well was completed, with slightly altered tools, without mishap, in fourteen days,—a rate of over 5 ft. per day. The wells were lined with ½-in. mild steel tubes, 5 ft. 11 in. in diameter, in 6-ft. lengths, with twenty-four 6-in. holes in each length, to allow the free ingress of water. The cost of the bored wells was under 1,700*l*.; whereas the author estimated that a single large well, lined with 18-in. brickwork, would have cost between 2,000*l*. and 2,500*l*. The two wells being distinct, with independent pumps, any accident to one would not interfere with pumping in the other, and any deepening could be easily effected in one without affecting the clearness of the water in the other. The author added a short account of the deep well on Southampton Common, bored, between 1838 and 1851, to a depth of 1,317 ft., when it only yielded 130,000 gallons a day. It traversed 850 ft. of Chalk, but did not reach the Upper Greensand; and an attempt, in 1882, to deepen it being frustrated by a broken tool lying at the bottom, it was finally abandoned, having involved a cost of 20,000*l*.

ARCHITECTURAL ASSOCIATION.

The twelfth ordinary meeting of this Association for the present session was held on the 22nd instant, Mr. J. A. Gotch (President) in the chair.

The following new members were elected, viz., Messrs. H. W. Braddock and P. Hayton.

Mr. G. Aitchison, A.R.A., read a paper entitled "Stray Thoughts on Architectural Education," which we print on another page.

The Chairman, in opening the discussion, said that Mr. Aitchison's "Stray Thoughts" were most suggestive. His tribute to the Association was well deserved, but, at the same time, it was in one sense a matter of regret to the profession that a voluntary concern should be the foremost means of obtaining an architectural education. There were in reality signs that if care was not taken the Association would eventually outgrow its own strength, and that the multiplicity of work it undertook, if grappled with effectively, would really develope into something more than had yet been attempted. He hoped, therefore, that in the forthcoming Conference some sort of means might be shadowed forth by which this important question might be met. The work done by the Association was most excellent, and he hoped it would be in no way slackened until it was replaced by something which was national in its character. The idea that ran through Mr. Aitchison's paper was an excellent one; it was that people should be made to think for themselves. When Mr. Aitchison said he desired style to be abolished, he (the speaker) could not help thinking of an observation made earlier in the session by Mr. Rickman, when he mentioned how painful was a false quantity in architecture, meaning that the style should be thoroughly mastered and be entirely pure. He (Mr. Gotch) was bound to say that Mr. Aitchison's suggestion for striking out on a fresh path rather commended itself to him. Nowadays they did not expect every architect to be a genius. There were over 1,000 members in the Architectural Association alone, and they could not possibly be all geniuses,—indeed, the profession would be in a bad way if they were. He had more than once in that room ventured to describe the arts which affected architecture as "common-sense made beautiful," and that struck him as being a not unreasonable definition. The present age was one of eclecticism. People did not go on from step to step in one style, working out their salvation as the Mediævalists did, who toiled in ignorance of what had been done before them. In Greek architecture the portico and the pillars were outside, while in Mediæval architecture they were taken inside. It was said that the latter course was pursued for the purpose of getting a greater effect of solemnity, but he did not suppose for a moment that the Gothic builders had any idea of Greek architecture. Mr. Aitchison had mentioned the designing of warehouses. Now directly the architect commenced to design a warehouse, he had to be restricted by the essential factors of the problem, so that if a picturesque building was designed, it might be found that some of the elementary notions ruling the designing of warehouses had been transgressed. One of these rules was that almost all the windows would have to be of one pattern, and it would be useless to think out any building of that kind merely as a matter of design; the thing must be based upon the requirements of modern life and the prosaic necessities of trade. The architects of the present day were, therefore, very much handicapped by restrictions such as were unknown to the Mediævalists. At the same time the business of the architect of the present day should be to grapple with those things, and make the best they could of them. If, therefore, they worked upon the lines suggested by Mr. Aitchison, he believed they would come very near solving the problem.

Mr. John Slater, B.A., thought there was a certain amount of contradiction in Mr. Aitchison's able paper, when he first stated that so much information could be obtained from the builder, and then later on told them that the architect should not only know the various methods of joining iron and stone, but also the weights those materials would carry, their compression, tension, and so forth. Now he did not consider that the ordinary builder could go into those technicalities at all. Then, with regard to styles and orders, Mr. Aitchison first said he did not consider it necessary to study the history or the various peculiarities of the ancient styles, but afterwards he said they ought to be studied, not necessarily for imitation, but to find out how the classical and Mediæval builders obtained their results. Mr. Aitchison had referred to the Mediæval architects and early builders being daring in putting up buildings without any particular knowledge. For a long time he (the speaker) had thought they had erred on the side of excessive strength, and that it would ill become the architects of the present day to refrain from taking advantage of the new discoveries with regard to the strength of materials, or to use an excessive quantity of timber or iron when a less quantity would do. He could not help expressing his personal regret that Mr. Aitchison had not been able to retain his position as one of the Examining Board at the Royal Institute of British Architects, as his services had always been of the greatest value. He agreed with a great deal of Mr. Aitchison's criticism as bearing on the obligatory Examination, though it did not seem to point to a diminution of its stringency, but rather to a division into two. It was a great deal to expect from the candidate to pass from one thing to another so rapidly, and to cram into one week what should be done in two weeks at separate times. Probably, therefore, the results of the coming Conference would tend in the direction of dividing the Examination into two parts. Mr. Slater concluded by proposing a hearty vote of thanks to Mr. Aitchison.

Mr. Lawrence Harvey considered that if a man had worked in stone he would be able to design in that material with much more character than if he had never had anything but sheets of paper before him. He believed he could answer the question as to why the Mediæval architects displayed such cleverness in designing. While in Paris he had the *entrée* to a guild of stonemasons, and had seen the way the young men were taught, and the results obtained therefrom. In this case everything was done by means of models, drawings being looked upon merely as a means to make those models, while to be received as a companion of the guild the necessary examination consisted of constructing a model in which every difficulty of masonry came into play. The result was that the head men of the guild were far superior to the professors of stereotomy at the École des Beaux Arts, and the Polytechnic School at Paris, in practical teaching. He considered that the education of architects should be based on practical labour; they ought to be taught carpentry, joinery, stone and wood carving, and, as the basis of all the science of architecture, they should certainly have knowledge of masonry.

Mr. H. O. Cresswell remarked that the paper had created in his mind a feeling that all one's previously-conceived notions of what an architectural education should be were entirely wrong; that they must not study the Greek, Roman, Gothic, or other styles, but begin by being original. That seemed to him to be a dangerous doctrine. They did not come there to learn to be original, for to teach the young architect to be original would be to put a weapon into his hands which would produce very curious results. Mr. Rickman's remarks as to false quantities were entirely opposed to that, and, indeed, Mr. Aitchison would be one of the first to lay his hands upon a false quantity shown in the work of any of the Academy students. If he had misunderstood Mr. Aitchison he hoped that gentleman would correct him, because if the members of the Architectural Association started on the basis of wishing to be original architects, he did not know where they would be in fifty years' time. He was glad to hear what Mr. Slater had said as to the Examination, because he considered that a great deal too much was crowded into the time; indeed, some candidates had broken down in the course of it. That was introducing into architectural education a system of pernicious cramming, and he believed there were now in the profession one or two men who were architectural crammers. The Examination should be a fair test of whether a man was capable of carrying on the profession of an architect, but it should not be necessary to cram, and he hoped during the Conference some practical turn would be given to the desultory conversations they had frequently had of late years, not only with reference to the Examination but to architectural education generally on this important subject.

Mr. G. Richards Julian seconded the vote of thanks. At the Conference on the 4th proximo several short papers would be read upon education, one by Professor Babcock, of Cornell University, where there was a regular system of architectural education. He believed that these papers, and the discussion that would arise, would do something to further this burning question.

Mr. A. O. Collard said that in thinking of the old architects, he had sometimes wondered how much of their success was owing to their own genius, and how much to the men who worked under them. No doubt Michelangelo designed the outline of the dome of St. Peter's, but he very likely relied more upon some stone-cutter to carry out the work than upon his own ideas of what the thing should be. In the past the architect designed, and trusted to the experience of the men under him, whereas now the practical man trusted to the architect.

Mr. Francis Hooper thanked Mr. Aitchison for his very encouraging paper. As to the voluntary system, the great strength of the Association lay in the fact that they as young men were banded together, and the older men knew what they wanted and had sympathy with the juniors. Young men again were more ready to adopt the latest improvements and innovations than were the older members of the profession, and were more willing to admire the work of contemporaries.

Mr. C. R. J. Hall said that although in the pamphlet supplied by the Institute to candidates for the Examination it was stated there would be nothing recondite in the Examination; some of the questions really required the study of an architectural glossary. An architect could design a thing which a mechanic could not even conceive, and many things based upon theory would frighten carpenters and others. Indeed, he believed that practical experience in building would hamper a man in designing. Ruskin had said in his "Seven Lamps of Architecture,"—which, by the way, seemed badly supplied with oil,—that architecture was a thing which did not exist but as a framework for showing off sculpture and painting, but he could name one brick building in the City without sculpture or painting upon it, and which yet took the notice of every architect. A College of Architecture was essential, and he only hoped the Association would eventually develope into one.

The vote of thanks was then put from the chair, and carried by acclamation.

Professor Aitchison, in replying, observed that it would take too much time to touch upon all the matters referred to in the discussion. The object he had in view in giving this paper was not to gratify his personal vanity, but to see if some clearer idea of what was absolutely wanted for the education of the ordinary architect could not be defined. If a law were enacted that no man should begin to practise as an architect until he had mastered the differential calculus the profession would be tremendously limited, even from a scientific point of view, and much more from an artistic one. What he had wished to point out was, that though the literary and historic part of architecture was delightful, and to some extent useful, it was not absolutely essential. That after a man had sufficient knowledge to enable him to practise creditably the science and art of architecture, he should be allowed to take up those things which would show him to be more highly accomplished as "extra" subjects, the acquirement of which would be regarded as an honour. Architecture without proportion could hardly be termed architecture at all, and they must learn proportion by studying those buildings that had passed through the ages and had generally met with the approbation of the cultivated. He had not meant to suggest that young students of architecture were not to learn how mouldings had been designed and grouped, and the other effects of architecture were got; quite the reverse. He did not advocate throwing off precedent; all the teaching he had given had been to show how styles appearing to be entirely new and diverse, for instance Saracenic and Gothic architecture, were immediate offshoots from the Roman and Byzantine, while it was new necessities and aspirations which caused the new and peculiar forms. It was very difficult to see, when there seemed no convergence of opinion amongst the profession or the public, how they should teach style, though, he hoped, a beautiful, original, and English style would some day be developed. There was thus striking difference between the architecture of the late Renaissance and that of the Middle Ages. If they looked at the older buildings, they could not help seeing that they were done by somebody constantly on the spot, and that many details were not arranged before hand, showing that the architects were men of originality and invention. The later Renaissance was very different, every part and detail appeared to have been studied and settled before hand. His hearers were those who had to keep alive the feeling for beauty in works of necessity, and although architects were very much overlooked, execrably paid, and with little honour, many of their works were the result of great study and very considerable genius.

A NEW CUPOLA FURNACE FOR FOUNDRIES.

THE German journal, *Stahl und Eisen*, states that Messrs. Greiner & Erpf, of Westphalia, a firm of engineers, some time ago invented a new cupola furnace for foundries. In the ordinary cupola furnace, one of the chief causes of the loss of heat is due to the circumstance that a large portion of the carbonic acid which is formed by the combustion of the coke, becomes, by its passage through the upper layers of red-hot coke, reduced to carbonic oxide, and in this form escapes through the chimney of the furnace. In the Greiner-Erpf furnace, however, the carbonic oxide is by combustion with oxygen again turned into carbonic acid in the upper part of the chimney, and the heat produced by this process utilised for the working of the furnace, the escaping gas only containing carbonic acid and no carbonic oxide. The lowest tuyeres before which the coke burned, are constructed as in an ordinary cupola furnace, but at a point above these three rows of smaller ones have been introduced, fixed spirally around the furnace. Each of the latter may easily be opened, tended, and closed, and is also fitted with a peep-hole, covered with a glass disc for the purpose of watching the progress of the combustion within. Experiments with the furnace have shown that there is a certain point in a furnace above the zone of combustion of coke at which, on air being blown into the furnace, the carbonic acid is set on fire and consumed, but not the coke. This point varies somewhat according to the quality of the coke used, the pressure of the tuyeres in the lower hearths, &c., but it may easily be ascertained by observations made in the upper part at different heights. Air is blown in at the moment found most advantageous from these observations, the pressure of the same being regulated by observing through the peep-holes that an even and continuous combustion takes place, and that the coke is not set in blast and consumed. The tending of the furnace is not attended with any particular difficulties. Experiments with the furnace appear to have proved most successful at several ironworks. Thus, for instance, in a furnace 80 cm. in diameter, an experiment was made whereby 100 tons of iron were smelted in twelve smeltings, the results of which showed a consumption of coke of 5·01 per cent. of the iron smelted, representing a saving, according to the proprietors of the works in question, of 33 per cent. of fuel as compared with the old cupola furnace. At some other works where the furnace has been tried the consumption of coke is reported, in percentage of the iron smelted, to have been 4·14, 4·0, 5·7, 4·5 per cent., figures which vary through the quality of the coke used.

ARCHITECTURAL ASSOCIATION VISITS.

THE sixth Saturday afternoon visit of the Architectural Association was made on Saturday, the 23rd inst., first to Messrs. Dent & Hellyer's Works, 21, Newcastle-street, to witness some interesting experiments with various forms of traps which had been arranged by Mr. Hellyer to illustrate the remarks he made during the discussion on Professor Corfield's paper read at the Association a few weeks ago. The first trap was a "Bower." This was shown to be untrapped by the discharge of a closet above, and smoke being introduced into the drain, it was seen to pass through the trap. A series of lead syphon traps were then shown, and tested for the amount of water they contained, the point being to show that as good a seal could be got with a pint of water as with 6½ pints, the amount contained in one of the forms. The value of foot ventilation was then shown by means of a length of soil-pipe filled with common gas, and a 1-in. ventilating-pipe over 50 ft. long. The gas burned as soon as the pipe was opened, and went out directly it was stopped. The next series of experiments were to show the necessity of trap ventilation, and the best forms of traps to prevent syphonage. The construction of valve-closets was explained, and the points of weakness pointed out. The action of flushing-tanks and grease traps was illustrated, and models of manholes illustrating the points to be looked to in their construction pointed out.

The second place visited was St. Bartholomew's-the-Great, Smithfield. Mr. Aston Webb met the members, and explained the restoration of the church which has been carried out under his direction, and which consists principally of work to the apsidal east end. The surrounding property has been acquired, and the next portion of the work proposed to be undertaken is the removal of the forge and the rebuilding to the transepts. As it is not contemplated to rebuild the nave, the organ has been placed at the west end under the western arch of the crossing, and in a position corresponding with the old rood-loft; the stalls underneath will be finished with canopies, so as to screen off the western wall. Only a portion of the woodwork to these stalls is at present carried out. Mr. Webb pointed out that by using blue Bath stone, and, varying the detail, he had been careful to make the restoration work so as not to interfere with the historic value of the old work, and every portion of old work that gave any indication of the various changes in style had been left, as, for instance, the traces of the fourteenth-century square end to the church.

THE VENTILATION OF SEWERS.

SIR,—I can endorse all that H. [p. 586, *ante*] says, on the above subject, and will, with your permission, give the results of my experience.

1. I covered an estate with thirty-three blocks of industrial dwellings. The drains were formed without any intercepting traps, and the soil-pipes were prolonged and carried up well above the roofs, two to each block. Here the drains are kept clean by the pressure of the water from the soil-pipes, and there are no smells in the street.

2. I covered another estate with fifteen blocks of dwellings. The drains were formed with intercepting traps and inspection chambers, where the drains are made of half-pipes. Here the drains are being constantly stoped up, the pressure of the water from the soil-pipes being destroyed at the inspection chambers, and the smell in the street from the gratings was so great that ventilating pipes from the sewers had to be put in to remedy it.

W. S. HORNER.

SIR,—The suggestion is made by "H.," on p. 586, that if every house put up a special blow-off pipe at the head of its drain for the sewer, then the foul air of the sewers would become so little dangerous that the present intercepting traps now being put in might be dispensed with. I do not think so: the danger is too great. Isolation entirely in the house from the air of the public sewer is much safer than trusting to ventilation or dilution.

If every house is to put up a special blow-off pipe for the sewer, the said pipe should be joined,—as I have often recommended it,—on the outer side of the main disconnecting trap between the house and the sewer.

If the work referred to by "H." as recently done on the "modern system" caused bad smells at the ground-gratings, I would like to know, supposing the work well done, what modern system is referred to?

The complaint is an argument for high-level blow-offs, but not for the disuse of intercepting traps.

Glasgow. W. P. Buchan.

MEMORIAL CHAPEL, EPWORTH.

Sir,—As one of the competitors for the above, I was astonished to see your last issue containing the illustration, &c., of this building, inasmuch as the estimated cost of the building for which I sent in plans was 2,000*l.*, and not 5,000*l.* which it appears is to be spent on the accepted design. Had the other competitors been allowed the larger sum of money their designs would have been very different, and probably the successful competitor might likewise have been also.

However, Mr. Hicks may, perhaps, be able and willing to explain this. Saml. Musgrave.

TILES IN TABLES.

Sir,—Will you kindly give me space to ask your readers if they could tell me what is the best way of setting Minton tiles in a table-top so that with ordinary usage the joints would not break and water percolate through them? I am afraid that any joint made of plaster of Paris would, in consequence of the unequal and varying shrinkage of the wood and the tiles, soon break. Would a joint made of pitch be better? The table-top would be of tiles with a margin of wood round outside and level with the tiles, and the weakest part of the job would, I think, be the joint between outside rows of tiles and wood margin. Is there not a glue made by some maker of wood-flooring for attaching same to concrete foundation? Would this do, though positions would be reversed, wood being at bottom instead of at top? I should be much obliged by any hints. W.

CHURCH-BUILDING NEWS.

Andover.—In Andover Church Miss E. Pressley has placed a memorial to her late uncle, Mr. Henry Thompson, for many years churchwarden and a Justice of the Peace, whose name is associated with the erection of the Cottage Hospital in that town. The memorial consists of ten full-length angels, about 2 ft. 3 in. in height, some in attitude of prayer, and others with musical instruments, sculptured by Mr. Harry Hems, of Exeter, from designs by Mr. William White, F.S.A. They stand upon pedestals left for the purpose, upon the dwarf chancel screen, erected some fifteen years ago, when the choir was brought forward into the nave, and other alterations made.

Grantham.—Four new oak screens have just been placed in the bays of the chancel of Grantham parish church, after designs furnished by Mr. J. Oldrid Scott, and forming part of the original design made when the restoration of the church was undertaken, twenty years ago, under Sir Gilbert Scott. With these and the fine painted reredos, by Mr. Blomfield, recently erected, the east end now presents a very rich effect. The screens are of oak, very massive, and a little more than 10 ft. high, of solid panel for about 5 ft., pierced above with tracery of Early Perpendicular character. The contract price for the four screens is 450*l.* The work has been entirely executed at Grantham, in the workshops of Messrs. Rudd & Son.

Redcar.—Since his appointment to the living two years ago, the Rev. F. H. Hill has been actively engaged in raising funds for the alterations to the church, and it is expected that the work will shortly be begun. According to the estimate of the architects, Messrs. Clark & Moscrop, Darlington, 800*l.* at least will be required. It is intended to re-seat the church throughout, re-arrange the chancel, lay tiled floors, provide new pulpit and reading-desk, and build a new vestry.

Sale.—The Church of St. Anne, Sale, is being extended, and the memorial stone of the new north wall has lately been laid. The extension will include the addition of a north aisle corresponding with the south aisle already existing, the building of an organ-chamber and choir-vestry on the south side of the chancel, and the erection of a porch at the west end of the church. The present accommodation comprises 566 rented and 223 free sittings, and by the projected enlargement the total number of sittings is to be increased to 845. While the workmen are engaged upon the fabric it is proposed also to effect some necessary repairs to the tower and spire and to reseat the gallery. For the whole of these proposed works a sum of 1,500*l.* is estimated to be necessary, and beyond that sum an expenditure of 500*l.* upon a new organ is contemplated. The contractor for the new building work is Mr. T. B. Kendall, under the superintendence of Mr. J. Lowe, architect, Manchester. It is anticipated that the operations will be completed about the end of June.

Sparkwell (Devon).—A carved oak Litany-desk was placed in Sparkwell Church, South Devon, on Easter Eve. It was designed by the Rev. E. Geldart, of Witham, Essex, and made by Messrs. Luscombe & Son, Exeter. The rector, the Rev. Pender Cudlip, has also commissioned Messrs. Luscombe & Son to make a carved oak pulpit for the church.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

4,065, Spring Hinges. S. Gerish.

The subject of this invention is an improvement on the hinges now generally known as "Gerish's hinges," which are made both single and double acting. The end of the chain, which is used to check the action of the spring, is now by this formed into a screw, and a long cylindrical nut is fitted on to the same.

6,312, Windows. J. Mason.

The windows made in accordance with this invention are mounted on the swing principle, and the swinging sash is carried from the window-frame by means of hinged weathering-plates, which plates are also similarly fitted at the side of the sash so as to cover the joints of the sash and frame. The plates have projecting beads to prevent draught.

6,370, Paints. R. Lavender.

The paints which form the subject of this invention have oxide of iron as a basis. The improvements are in the direction of heating the copperas or sulphate of iron, then crushing or grinding it and exposing it in thin layers to heat with a free passage of air through the retorts.

9,314, Door-knobs. H. G. Hesketh.

The knobs which are the subject of this patent are fastened to their spindles at one end by means of a wedge being driven into a slot cut in the end of the spindle, the spindle thereby expanding inside the spindle-hole, which has been previously widened at its posterior end on two sides of the hole (which is square) to admit of the expansion of the spindle.

4,496, Flushing Cisterns. T. & J. Holt.

This invention has for its object a cheap and serviceable flushing cistern, so arranged that the water can only pass into the flush-pipe when the cistern is in actual use. The cistern may be brought into action by either a violent or gentle movement, and when either takes place, the supply of water to the cistern is closed or stopped. In syphon cisterns, the whole cistern is pivoted; in non-syphon cisterns this is impracticable, but a lever carrying a small tray or dash-board oscillates instead, and cuts off the communication between the ball-cock and the cistern before the flushing-pipe is opened.

6,019, Gas Brackets. R. H. Best.

This patent relates to cantilever brackets in lights of the Wenham or similar pattern, and allows a regenerative burner to be used with this class of bracket. It not only provides for carrying the burner, but also provides an upward flow governor, arranged and provided so as to be thoroughly accessible without dismantling any structural parts.

6,221, Fireproof Floors. C. S. Williams.

The floors mode according to this system are attached to the girders carrying the floor, a casing of concrete or other fireproof material, shaped to receive slabs of a similar material which form the fireproofing between the encased girders.

NEW APPLICATIONS FOR PATENTS.

April 15.—5,471, J. Dedicoat, Fasteners for Window Sashes and other Sliding Frames.—5,476, D. Burns, Utilisation of Waste Products and Manufacture of Bricks and Tiles therefrom.—5,477, D. Cowan, Cooking Ranges, Stoves, or Fireplaces.—5,510, H. and E. Rielle, Pegs for joining together Joinery, Carpentry, Cabinet Work, &c.

April 16.—5,575, W. Horn, Kitchen Cabinet.—5,582, J. Scott, Decorating Glass for Windows, &c.

April 18.—5,611, J. Eaton and J. Hubaud, Gaseliers, Gas Brackets, &c.

April 19.—5,667, J. Drummond, Chimney Cowls.—5,671, W. Roberts, Joints of Drain Pipes.—5,681, R. Black, Die Holder for Bricks, Tiles, Pipes, &c.—5,692, C. Shepherd, System of Sewerage for Buildings.—5,694, F. Griffith, Sound Producing Lock and Door Knob or Handle.—5,702, J. Armstrong, Glazing.—5,723, S. Pitt, Manufacture of Building Materials from Glass.

April 20.—5,732, J. Martin, Pans and Seats of Water Closets.—5,748, A. Payne, Door Bolts, &c.—5,751, J. Horrocks, Ventilating Buildings, &c.—5,752, S. Taylor, Saws.—5,762, T. Panario, Water-Waste Preventers.—5,765, G. Thornborough, and E. Lamour, Swivelling Sliding Doors or Partitions.

April 21.—5,815, T. Lodge, Portland Cement.—5,825, J. Rowland, Air, Water, and Fire Proof Doors.—5,828, J. Ward and W. Jones, Window Sashes.

PROVISIONAL SPECIFICATIONS ACCEPTED.

483, E. Wilson, Fixing Door Knockers, &c.—2,805, E. Lloyd, Fastening for Windows, Casements, and Doors.—3,256, G. Jeffery, Covering for Roofs.—3,587, E. Eaton, Sash and Cord Pulleys.—3,889, F. Abbey, Construction and Formation of Main Drains, Conduits, or Sewage Pipes.—3,973, W. Duncan, Glazed Roofs.—4,033, R. Ninnes, Casement Stay.—4,151, J. Robertson, Fireproof Floors and Ceilings.—4,194, W. Skinner, Water-closets.—4,254, M. Syer, Water-waste Preventer.—4,285, A. Dresser, Heating Buildings, Rooms, &c.—4,630, J. Holmes, Automatic Fire Alarm for Buildings, Workshops, &c.—4,772, J. Stawitz, Water Meters.—3,073, D. Knowles, Window Sash Fastener.—3,890, J. Taylor, Self-acting Ventilator.—4,193, H. Stevenson, Horticultural Buildings.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,316, W. Allen, Flushing Closets.—7,519, E. Salendre, Sawing, Cutting, Dressing, or Polishing Stone.—7,666, T. Helliwell, Fixing Sheets of Glass, Zinc, Slate, &c., for Covering Roofs, Flats, or Sides of Railway Stations, Greenhouses, &c.—8,120, S. Lowden, Portland Cement.—8,152, H. Keene, Lead Glazing.—16,680, S. Harvey, Fixing Tiles and Slates to prevent Wind-stripping.—3,938, W. Day, Chimney Cowl.—6,831, P. Davies, Stench Traps.—8,145, W. Smeaton, sen., Water-closets.—8,146, W. Smeaton, sen., Flushing Apparatus.—8,175, T. Howdill, Window Sashes and Frames.—8,318, S. Waller and T. Wiseman, Cowl.—3,486, G. Newman, Door Checks and Springs.

The Student's Column.

FIELD WORK AND INSTRUMENTS.—XVIII.

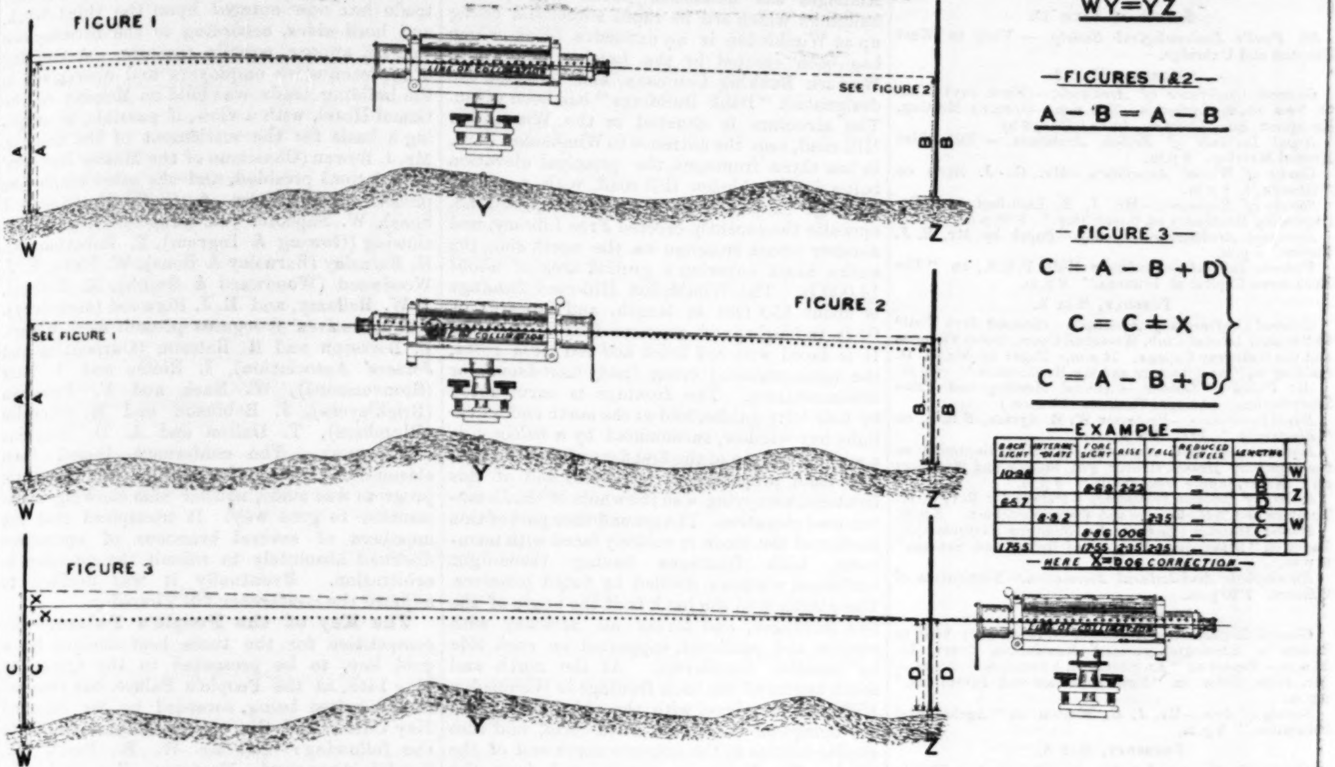
Levelling Instruments.

II.—ADJUSTMENT FOR COLLIMATION.

THE line joining the optical centre of the object-glass and a point in the line of the horizontal cross hair in the diaphragm of a Level should be horizontal when the longitudinal bubble is in the centre of its run. This adjustment is effected by the capstan-headed adjustment screws at the eye end of the telescope, which serve to raise or depress the diaphragm plate. Theoretically, a re-determination of this adjustment, known as "the adjustment for collimation," should be effected whenever the object-glass is removed from the telescope; but if the object-glass be carefully screwed home, or returned as near as possible to the exact position it occupied before removal, this adjustment need not be repeated. After conveying the instrument by railway, or when carried in a cab for some distance, the collimation adjustment should be tested prior to using the instrument for taking levels. It is generally determined by the makers, with the use of an adjusted level as a "collimator." The cross hairs of the adjusted level are placed in the principal focus of the object-glass, which is of long focal length, so as to adjust for an infinite distance. The instrument is set up level, and the eye-piece removed from its socket. As a temporary protection for the cross hairs, a piece of plain glass may be inserted. The shade covers are also taken off each telescope. It will be seen from the diagram that when the instrument to be adjusted is set level, a pencil of rays, proceeding from a point in the plane of the horizontal cross hair of the diaphragm of the collimator, will, after passing through the object-glass, run parallel, and should the axis of the pencil be horizontal, the parallel rays between the two levels will be also horizontal. The parallel rays, after emergence from the level, which is used as a collimator, falling upon the object-glass of the level to be adjusted, will be converged to a point within the telescope, and an image of the wires or cross hairs of the collimator will be formed. The horizontal cross hair of the level under adjustment should then be made to coincide with the image of the horizontal cross hair from the adjusted level, which is used as "the collimator," by loosening one of the collimation adjustment screws in the instrument to be adjusted, and tightening the other, care being taken to observe that the longitudinal bubbles in both instruments remain in the centre of their run while the adjustment is being made. As indicated by the diagram, a little difference in the height of the two instruments will not affect the result, but it is desirable to reduce this difference of level to a minimum.

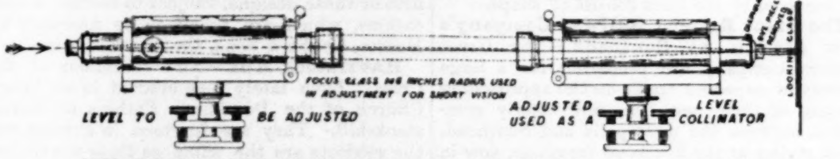
A ready means of adjusting the fixed telescope of a dumpy level for collimation, without the aid of a collimator, is illustrated by figs. 1, 2, 3. Three pegs are driven into

DUMPY LEVEL ADJUSTED FOR COLLIMATION



BACK SIGHT	INTERMEDIATE	FORE SIGHT	RISE	FALL	REDUCED LEVELS	LENGTHS	
10·98					—	A	W
		8·69	2·29		—	B	Z
6·57					—	D	
	8·92			2·35	—	C	W
		8·86	0·06		—	C	
17·55		17·55	2·35	2·35	—		

DUMPY LEVEL.—DIAGRAM SHOWING METHOD ADOPTED BY THE INSTRUMENT MAKER FOR THE ADJUSTMENT OF THE LINE OF COLLIMATION IN THE LEVEL.——


FOCUS GLASS INCHES RADIUS USED IN ADJUSTMENT FOR SHORT VISION
LEVEL TO BE ADJUSTED
ADJUSTED LEVEL USED AS A COLLIMATOR
DIAPHRAGM PLATE
EYE PIECE REMOVED
LOOKING GLASS

NOTE—THE LEVEL OF THE LINE OF COLLIMATION NEED NOT NECESSARILY BE EXACTLY THE SAME IN THE TWO INSTRUMENTS IN ORDER TO MAKE THE ADJUSTMENT.—(SEE DOTTED AND FULL LINES ABOVE)

the ground as far apart as practicable, and at equal distances, say 4½ chains, or about 300 ft. apart. Place the instrument over the centre peg marked Y, and having set the bubble level, read the staff on the peg W (fig. 1). Then turn the telescope horizontally half-round, carefully re-set the bubble, if necessary, and read the staff on peg Z (fig. 2). It will be evident that the correct difference of level between the points W and Z can be thus obtained, because if the reading of the staff A be above or below the true line of collimation, as indicated by the dotted lines in the diagram (fig. 1), the error at the same distance from the instrument will be the same in the case of the staff B (fig. 2). Having determined the true difference of level between the points W and Z by figs. 1 and 2, set up the level near to the highest of these points in line with both points W and Z, but not between them (fig. 3). Adjust the longitudinal bubble to the centre of its run, and read the staff first upon the point Z, and next upon the point W. The difference of level should be the same as previously determined. If any discrepancy exists, calculate from the amounts arrived at by figs. 1 and 2 what the staff C over the point W in fig. 3 should read, and by means of the collimating screws adjust the horizontal cross hair until this reading upon the staff C is obtained. The distance between the instrument and the staff D in fig. 3 should be so simply sufficient to clearly read the divisions upon the staff through the telescope, in order that any divergence of the line of collimation from the true level may have an inappreciable effect upon the height read on the staff D. If the distance between the more distant staff and the instrument be considerable, allowance must be made for the curvature of the earth and for refraction, but it is not advisable to read the staff at a greater distance than the surveyor finds convenient for giving the staff-holder full instructions. It is also necessary to define each point in detail where the staff is held, which cannot be done so accurately when a long distance intervenes between the instrument and the level staff.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

APRIL 19.

By F. JOLLY & Co.

Stamford Hill—46, Cazenove-road, 89 years, ground-rent 11*l*.	£900
Stoke Newington—31, Osbaldeston-road, 91 years, ground-rent 8*l*. 8s.	475

By BEAN, BURNETT, & Co.

Brixton Hill—1, 2, and 3, Mill-lane, freehold	590

By T. SPINK.

St. John's Wood—40, 42, and 48, Cochrane-street, 33 years, ground-rent 15*l*. 15s.	1,100

By ROGERS, CHAPMAN, & THOMAS.

Mitcham—Seven plots of freehold land, 5a. 3r. 0p.	740

By FULLER, HORSEY, SONS, & CASSELL.

West India Dock-road—3, Limehouse-causeway, freehold	550
5, Limehouse-causeway, copyhold	500
East India Dock-road—1, 3, and 5, Bath-street, 56 years, ground-rent 12*l*. 10s.	550
1 and 2, Myrtle-cottages, 56 years, ground-rent 4*l*.	240
1 to 9, Grove-villas, freehold	2,150
1 to 4, Ivy-cottages, 56 years, ground-rent 8*l*.	520
Bromley—45 to 53 odd, Ellesmere-street, freehold	1,325
50 to 56 even, Brabazon-street, freehold	890

APRIL 20.

By RUSHWORTH & STEVENS.

Westbourne Park—48, Southam-street, 76 years, ground-rent, 7*l*.	170
North Kensington—2, Wheatstone-road, 88 years, ground-rent 7*l*. 10s.	220
31 and 34, Treverton-street, 76 years, ground-rent 14*l*. 10s.	280
Shepherd's Bush—80, Conningham-rood, 80 years, ground-rent 6*l*. 10s.	145

By A. & F. CARTER.

Clapham Junction—Ground-rent of 27*l*., reversion in 92 years	595

By R. TIDEY & SON.

Highbury—17, St. Paul's-road, 59 years, ground-rent 7*l*.	500
Canonbury—24, Canonbury-villas, 31 years, ground-rent 8*l*.	330

APRIL 21.

By INMAN, SHARP, & HARRINGTON.

Bloomsbury—1, Queen-square-place, freehold	1,010

By A. WALTON.

Page Green—2, Park-terrace, freehold	590
Carshalton—Ground-rent of 16*l*. 16s., reversion in 92 years	350

By NEWBON & HARDING.

Hoxton—22 and 24, Felton-street, 50 years, ground-rent 6*l*. 10s.	1,000
69 and 70, Forston-street, 16 years, ground-rent 45*l*.	500
Holloway—121 and 123, Corbyn-street, 83 years, ground-rent 12*l*. 12s.	495
Stamford Hill—5, Grange Court-road, 88 years, ground-rent 6*l*. 10s.	£330
6 and 7, Grange Court-road, 88 years, ground-rent 13*l*.	700
Stoke Newington—35 and 37, Cowper-road, freehold	900

By C. C. & T. MOORE.

Mile End—8, 10, and 12, St. Peter's-street, 43 years, ground-rent 9*l*.	725
Old Gravel-lane——"The Meeting House Building," freehold	380
Forest Gate—4, Gordon-villas, 96 years, ground-rent, 3*l*. 5s.	130
South Hackney—70 and 72, Cassland-road, 68 years, ground-rent 12*l*. 12s.	645
Bexley Heath—A plot of freheold land	95

By VENTOM, BULL, & COOPER.

Honiton, near—Higher Ridge Farm, 5 a. 1r. 12p., freehold	900

By WORSFOLD & HAYWARD.

Dover—29 and 31, Biggin-street, freehold	3,700
10 and 11, Winchelsea-street, freehold	420
19 and 21, Randolph-gardens, freehold	750
17 and 18, Queen's-gardens	240

APRIL 22.

By SALTER, REX, & Co.

Kentish Town—22, Carlton-road, 64 years, ground-rent 6*l*.	290
Highgate—9, 11, and 17, Lulot-street, 93 years, ground-rent 14*l*. 10s.	280

By FULLER & FULLER.

Sevenoaks—Vine Court-road, a plot of freehold land	180

By HARMAN BROS.

Raynes Park—Two Plots of freehold land	100

By BAKER & SONS.

Transvaal—Cecilias Home Farm, about 5,291 acres	360
Grootpan Farm, about 6,349 acres	600
Mosilaagte Farm, about 4,233 acres	320
Schoongezigt Farm, about 6,349 acres	330
Herts, Bengeo—Two freehold villas	700
Puckeridge, High-street, Brecknock House, and 6 acres, freehold	825
An enclosure of freehold land, 6a. 0r. 28p.	1,100
Hertford, Bircherley-street—Freehold cottage	80

By C. & H. WHITE.

Brixton—21, Bellefield-road, 77 years, ground-rent 5*l*.	285
18, Treherne-road, 76 years, ground-rent 4*l*.	325
Stockwell—46 and 48, Aytoun-road, freehold	970
South Lambeth road—A plot of freehold land, area 7,500 ft.	1,110
A plot of freehold land, area 12,110 ft.	1,580
A plot of freehold land, area 3,970 ft.	520
A plot of freehold land, area 5,650 ft.	1,210
A plot of freehold land, area 4,540 ft.	680
A plot of freehold land, area 7,125 ft.	1,280

By C. D. FIELD & SONS.

Bermondsey—216, 218, and 220, St. James's-road, 62 years, ground-rent 17*l*.	965
2[illegible]9 to 229 odd, Lynton-road, 62 years, ground-rent 66*l*.	3,010
224 to 230 even, Lynton-road, 62 years, ground-rent 20*l*.	940
Southwark—63, High-street, freehold	2,800
Bermondsey—139, Jamaica-road, and 41, Martin-street, 59 years, ground-rent 6*l*.	660
45 and 50, Frean-street, 29 years, ground-rent 3*l*.	375
Ground-rent of 4*l*. 10s., reversion in 27 years	130
Notting Hill—78 and 80, Lansdowne-road, freehold	1,600
Hammersmith—2 and 4, St. Peter's-grove, 39 years, ground-rent 8*l*.	405

Robert Boyle & Son (Limited).—An extraordinary general meeting of this company was held on Wednesday, the 20th inst., in the Cannon-street Hotel, to consider resolutions for altering the company's Articles of Association as proposed by Mr. Robert Boyle, the managing director, and which were passed unanimously.

MEETINGS.

SATURDAY, APRIL 30.

St. Paul's Ecclesiological Society. — Visit to West Drayton and Uxbridge.

MONDAY, MAY 2.

General Conference of Architects.—(First day) Visit to New Stock Exchange. 3·45 p.m.—Opening Meeting, Reception, &c. 7 30 p.m., to be followed by

Royal Institute of British Architects. — Fifty-third Annual Meeting. 8 p.m.

Clerks of Works' Association.—Mr. G. J. Egan on "Granite." 8 p.m.

Society of Engineers.—Mr. J. B. Lightfoot on "Refrigerating Machinery on Board Ship." 7·30 p.m.

Liverpool Architectural Society.—Paper by Mr. E. J. Tarver. 7 p.m.

Victoria Institute.—Professor Hull, F.R.S., on "The Rock-hewn Capital at Idumæa." 8 p.m.

TUESDAY, MAY 3.

General Conference of Architects.—(Second day) Visits to National Liberal Club, Whitehall Court, Hotel Victoria, and the Holloway College. 11 a.m.—Paper by Mr. J. D. Sedding on "Architecture and the Handicrafts." 8 p.m.

Art Union of London. — Annual Meeting and Prize Distribution. (Adelphi Theatre. 12 noon.)

Royal Institution.—Professor W. E. Ayrton, F.R.S., on "Electricity." III. 3 p.m.

Institution of Civil Engineers.—Further discussion on the papers by Messrs. Grover, Fox, Stooke, and Matthews on "Water-Supply from Wells." 8 p.m.

Society of Biblical Archæology.—Papers by Rev. G. H. Tomkins and MM. Eugene and Victor Revilloux. 8 p.m.

Parkes Museum (*Lectures for Sanitary Inspectors*).—Paper on "Scavenging, Disposal of Refuse and Sewage." 8 p.m.

Birmingham Architectural Association.—Nomination of Officers. 7·30 p.m.

WEDNESDAY, MAY 4.

General Conference of Architects —(Third day) Visit to houses in Harrington-gardens, Kensington Court, &c. 11 a.m.—Papers on "Architectural Education." 3 p.m.—Mr. John Slater on "New Materials and Inventions." 8 p.m.

Society of Arts.—Mr. J. C. Morton on "Agricultural Education." 8 p.m.

THURSDAY, MAY 5.

General Conference of Architects.—(Fourth day) Visit to the City and Guilds Institute, South Kensington. 11 a.m. —Report of the Special Federation Committee. 3 p.m.—*Conversazione* at South Kensington Museum. 9 p.m.

Society for the Encouragement of Fine Arts.—Conversazione at the Galleries of the Royal Institute of Painters in Water-Colours, Piccadilly. 8 p.m.

FRIDAY, MAY 6.

General Conference of Architects.—(Fifth day) Visit to the Drainage Works at the Houses of Parliament. 11 a.m. —Papers on "The Registration of Architects." 3 p.m.

Royal Institute of British Architects.—Presentation of Royal Gold Medal, &c. 8 p.m.

Architectural Association.—Mr. J. L. Robinson, R.H.A., on "An Irishman and his Camera in England, a Dark Seance." 7 p.m.

Parkes Museum (*Lectures for Sanitary Inspectors*).—Mr. C. E. Cassal, F.C.S., F.I.C., on "Food (including Milk), Sale of Food and Drugs Act." 8 p.m.

SATURDAY, MAY 7.

General Conference of Architects.—(Sixth day) Visit to the Diploma Gallery of the Royal Academy, &c. 11 a.m.

Royal Institute of British Architects.—Members' Dinner, Freemasons' Tavern. 7 p.m.

Architectural Association. — Visit to the National Liberal Club. 3 p.m.

Edinburgh Architectural Association.—Visit to Linlithgow Palace and St. Michael's Church.

Association of Public Sanitary Inspectors.—Address by the President, Mr. Edwin Chadwick, C.B. 6·30 p.m.

Miscellanea.

Birmingham Students of the Institution of Civil Engineers.—The association of the Birmingham students of this Institution held their seventh meeting of this session at the Colonnade Hotel, Birmingham, on the 21st inst., Mr. C. Hunt, Member of the Institution of Civil Engineers (Vice-President), in the chair. Mr. H. L. Tarbet, student of the Institution of Civil Engineers, read an interesting paper upon the Wellington (Somerset) Waterworks, as designed by Mr. E. Pritchard. The water supply is conveyed by gravitation from springs at Westford to the pumping station (about 450 yards distant), whence it is pumped into a circular iron tank on the top of a brick tower, and then distributed in the town. The pumping machinery and gas engines are in duplicate, and each engine can work separately each or both set of pumps. Dowson's patent economic gas apparatus is adopted to drive the gas engines. The paper was illustrated by large diagrams, and an interesting discussion followed its reading.

Beccles.—The large east window of Beccles Parish Church has just been filled with stained glass. The window consists of seven long lights and numerous tracery windows. Twenty-one subjects, taken from the life of Christ, have been illustrated in the lights, and the tracery pieces contain figures of the Twelve Apostles, with angels, cherubim, &c. The work has been carried out as the result of a subscription amongst parishioners and friends. Messrs. Heaton, Butler, & Bayne, of Garrick-street, London, were the artists who designed and executed the work.

New Bank Buildings at Wimbledon.—Amongst the numerous public and private buildings which are in rapid succession rising up at Wimbledon is an extensive block which has been erected by the London and South Western Banking Company, and to which the designation "Bank Buildings" has been given. The structure is situated in the Wimbledon Hill-road, near the entrance to Wimbledon Park. It has three frontages, the principal elevation being in Wimbledon Hill-road, with a return frontage on the south side, in Compton-road, opposite the recently-erected Free Library, and another return frontage on the north side, the entire block covering a ground area of about 14,000 ft. The Wimbledon Hill-road frontage is about 150 feet in length, and upwards of 60 ft. in height, and contains four lofty floors. It is faced with red brick and red terra cotta, the latter material being freely introduced for ornamentation. The frontage is surmounted by four lofty gables, and at the north end a five-light bay window, surmounted by a balcony, is a special feature at the first floor of the frontage. The bank proper is at the south end of this frontage, occupying also the whole of the Compton-road elevation. The ground-floor part of this portion of the block is entirely faced with terra-cotta, both frontages having three-light mullioned windows, divided by fluted pilasters. The entrance to the bank is at the angle of the two frontages, and forms an archway with cornice and pediment, supported on each side by massive cantilevers. At the north and south angles of the back frontage in Wimbledon Hill-road, on a level with the third floor, there are octagonal turrets in terra-cotta, and also similar turrets at the extreme north end of the block. The buildings were erected from the designs of Mr. James Edmeston, Mr. H. Johnson, of Park-avenue, Wood Green, being the contractor. Those portions of the block not occupied by the bank consist of shops.

The Great Eastern Railway Company's New Station at Southend.—The Great Eastern Company are preparing for a large amount of expected traffic on the approaching opening of their new line, now nearly completed, between the metropolis and Southend. Their station at the Southend terminus, now in course of construction, will occupy an extensive area of land which the company have secured. In the first instance they purchased an estate of twelve acres for station and siding purposes, but this not being considered sufficient the company are now negotiating for the purchase of a still further quantity of land immediately adjoining, in anticipation of its being found necessary to increase the station accommodation now being provided. The dimensions of the station will be seen when it is stated that there will be five platforms, each about 900 ft. long. Amongst the other new stations on the new branch between the main line at Brentwood and Southend, the directors have just decided to erect one at the interesting Essex village of Prittlewell, near Southend.

St. Mary Church (Devon).—Mr. S. J. Smith, C.E., one of the inspectors of the Local Government Board, held an inquiry a few days since at the St. Mary Church Town-hall, consequent upon the application of the Local Board for power to borrow 1,650*l.* for works of street improvement, the purchase of a steam roller and crusher, and sundry other purposes. There was considerable opposition to the proposal, which led the Inspector to say that he had abundant evidence that by the use of a steam roller and crusher 30 per cent. was saved in road-making. He was perfectly astonished at the opposition, thinking it would have been "t'other way about." In the case of four local boards in Cumberland and Westmoreland, who had joined together in buying a steam-roller, and whose action had been sanctioned by the Local Government Board, the roads were more narrow and hilly than any in the St. Mary Church district.

The Registration of Plumbers.—At the Guildhall, on Saturday last, Alderman Knill presiding, supported by Messrs. W. H. Webb, J. C. Ashdown, and L. Gilbert, members of the Registration Committee, certificates of registration were issued to thirty-one master plumbers and seventy-seven journeymen plumbers. Besides those from the London district, plumbers attended from Brighton, Bristol, Cheltenham, Chichester, Dartford, Eastbourne, Exeter, Gloucester, Grimsby, Guildford, Hastings, Lincoln, Luton, Oxford, Ramsgate, St. Leonards, Salisbury, Tunbridge Wells, Wolverhampton, and York.

The Strike in the Building Trade at Birmingham.—The strike in the building trade has now entered upon the third week, and both sides, according to the *Birmingham Gazette*, appear equally resolute. A meeting of representative employers and operatives in the building trade was held on Monday at the Grand Hotel, with a view, if possible, to adopting a basis for the settlement of the dispute. Mr. J. Bowen (Chairman of the Master Builders' Association) presided, and the other employers present were Messrs. A. S. Smith (Smith & Sons), W. Sapcote, jun. (Sapcote & Sons), F. Gowing (Gowing & Ingram), T. Robotham, C. H. Barnsley (Barnsley & Sons), W. Blore, H. J. Woodward (Woodward & Smith), R. Folland, J. W. Bellamy, and E. J. Bigwood (secretary). The operatives' delegates present were Messrs. E. Boraston and R. Bateson (Carpenters and Joiners' Association), I. Ridlee and J. Farr (Stonemasons), W. Nash and F. Freeman (Bricklayers), J. Robinson and R. Cheshire (Plumbers), T. Dalton and A. D. Hopkins (Plasterers). The conference lasted from eleven o'clock till half-past four, but very little progress was made, neither side showing a disposition to give way. It transpired that the members of several branches of operatives declined absolutely to submit the question to arbitration. Eventually it was decided to adjourn the conference till Thursday.

The Key of the People's Palace.—The competition for the three best designs for a gold key, to be presented to the Queen on May 14th, at the People's Palace, has resulted in the prizes being awarded by Sir Edmund Hay Currie and Sir George Hayter Chubb to the following:—1st, Mr. W. B. Pratt, 162, Sandringham-road, Hackney, E.; 2nd, Mr. George Evison, 8, King's-road, Upton Park, E.; 3rd, Mr. George Jones, 323, Old Ford-road, E. The key will be modelled on the style of the first of these designs, subject to certain modifications, which are found to be necessary by Messrs. Chubb & Sons, the manufacturers.

Haverstock-Hill.—New "Stations of the Cross" have lately been erected in the Priory Church of the Dominican Fathers at Haverstock-hill. They are fourteen in number, and the subjects are the same as those always traditionally used. The composition of these subjects is, however, said to be entirely new. This is especially so in the last or fourteenth (the entombment of our Lord), in which our Lord's body is represented entirely swaddled as a mummy, even the face being covered. It is stated that no artist has previously given this treatment. The paintings are by Mr. N. H. J. Westlake, F.S.A.

Malvern.—A window, to the memory of the late Mr. Andrew Henderson, M.R.C.S., which has been placed in Christ Church (the Fisk Memorial), by Colonel and Mrs. Forbes, two of the late doctor's patients, was unveiled on the 9th inst. The work has been executed by Messrs. Clayton & Bell, of London. The subject is "The Resurrection."

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ......ton	6	10	0	7	10	0
Teak, E.I. ......load	9	0	0	14	0	0
Sequoia, U.S. ......foot cube	0	2	3	0	3	0
Ash, Canada ......load	3	0	0	4	10	0
Birch ,, ...	2	0	0	3	10	0
Elm ,, ...	3	10	0	4	10	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	2	10	0	4	10	0
,, Canada	3	0	0	6	0	0
Pine, Canada red	2	0	0	3	10	0
,, yellow	2	5	0	4	0	0
Lath, Dantsic ......fathom	3	0	0	5	0	0
St. Petersburg	4	0	0	5	10	0
Wainscot, Riga ......log	2	15	0	4	0	0
,, Odessa, crown......	2	15	0	3	0	0
Deals, Finland, 2nd and 1st...std.100	7	0	0	8	0	0
,, 4th and 3rd	5	10	0	6	10	0
Riga	5	10	0	7	0	0
St. Petersburg, 1st yellow	8	10	0	14	0	0
,, 2nd ,, ...	7	0	0	8	0	0
,, white	6	0	0	9	0	0
Swedish	6	0	0	15	0	0
White Sea	7	0	0	16	10	0
Canada, Pine, 1st	17	0	0	25	0	0
,, ,, 2nd	11	0	0	16	0	0
,, ,, 3rd, &c.	6	0	0	9	0	0
,, Spruce, 1st	8	0	0	10	0	0
,, ,, 3rd and 2nd	5	0	0	7	0	0
Deals—New Brunswick, &c.	5	0	0	7	0	0
Battens, all kinds	4	0	0	11	0	0
Flooring Boards, sq. 1 in., prepared, First	0	8	0	0	11	6
Second	0	6	6	0	7	6
Other qualities	0	5	0	0	6	0
Cedar, Cuba ......foot	0	0	3	0	0	3½
Honduras, &c.	0	0	2½	0	0	3½
Australian	0	0	2	0	0	3
Mahogany, Cuba	0	0	4	0	0	7
St. Domingo, cargo average	0	0	4	0	0	6

TIMBER (*continued*).	£.	s.	d.	£.	s.	d.
Mahogany, Mexican, cargo av.	0	0	3¼	0	0	4¼
Tobacco ,,	0	0	4	0	0	6
Honduras ,,	0	0	4	0	0	6
Maple, Bird's-eye	0	0	6	0	0	8
Rose, Rio ...ton	7	0	0	10	0	0
Bahia	6	0	0	10	0	0
Box, Turkey ...ton	5	0	0	15	0	0
Satin, St. Domingo ...foot	0	0	5	0	0	10
Porto Rico	0	0	6	0	0	10
Walnut, Italian	0	0	4	0	0	5
METALS.						
IRON—Bar, Welsh, in London...ton	4	7	6	4	15	0
,, ,, in Wales	4	2	6	4	7	6
,, Staffordshire, London	5	10	0	6	0	0
Sheets, single, in London	6	15	0	8	10	0
Hoops ,,	6	0	0	7	0	0
Nail-rods ,,	5	15	0	6	10	0
COPPER—						
British, cake and ingot ...ton	43	0	0	43	10	0
Best selected	44	5	0	45	5	0
Sheets, strong	50	0	0	51	0	0
Chili, bars	39	7	6	40	0	0
YELLOW METAL ...lb.	0	0	4 1/16	0	0	4¼
LEAD—						
Pig, Spanish ...ton	12	7	6	0	0	0
English, common brands	12	15	0	0	0	0
Sheet, English	13	10	0	13	15	0

METALS (*continued*).	£.	s.	d.	£.	s.	d.
SPELTER—						
Silesian, special ...ton	14	5	0	0	0	0
Ordinary brands	14	2	6	0	0	0
TIN—						
Straits ...ton	101	5	0	111	15	0
Australian	101	15	0	0	0	0
English ingots	105	5	0	0	0	0
ZINC—						
English sheet ...ton	16	0	0	0	0	0
OILS.						
Linseed ...ton	20	7	6	20	10	0
Cocoanut, Cochin	32	0	0	35	0	0
Ceylon	25	0	0	0	0	0
Palm, Lagos	21	10	0	0	0	0
Rapeseed, English pale	21	10	0	21	15	0
,, brown	20	0	0	20	5	0
Cottonseed, refined	18	0	0	20	10	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined	5	0	0	12	0	0
TURPENTINE—						
American, in casks ...cwt.	1	8	0	1	9	0
TAR—						
Stockholm ...barrel	0	15	0	0	0	0
Archangel	0	12	0	0	0	0

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page
Infectious Diseases Hospital	Old Swindon, &c., L. B.	Not stated	June 8th	ix.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Kerbing, Tarpaving, Metalling, &c., Work	Lewisham Bd. of Wks.	*Official*	May 3rd	ii.
Public Baths, Brighton	Brighton Cor.	do.	do.	ii.
Wood Paving	Westminstr Bd. of Wks	G. R. W. Wheeler	May 4th	ii.
Works and Materials for Waterworks	Burnham Local Board	J. Newton & Son	May 5th	ii.
Portland Cement	Brighton Town Council	P. C. Lockwood	do.	ii.
Iron Hopper Barges	Admiralty	*Official*	May 6th	ii.
Road Materials, &c.	Kingston-on-Thames Cor	do.	May 9th	ii.
Brick Retaining Wall, Footpath, &c.	West Ham Council	Lewis Angell	May 10th	ix.
Pipe Sewers, &c.	Willesden Local Board	O. Claude Robson	do.	ix.
Alterations and Additions to Wards	West Ham Union	F. J. Sturdy	May 11th	ii.
Public Hall, Offices, Free Library, &c.	Buxton Local Board	W. Pollard	do.	ii.
Rebuilding Bridge	County of Brecknock	*Official*	do.	ix.
Road-making and Paving Works	Greenwich Bd. of Wks.	do.	do.	ix.
Road-making and Paving Works	Hammersmith Vestry	do.	do.	ix.
Public Offices, Memorial Hall, &c.	Ealing Local Board	C. Jones	May 12th	ii.
Interior Renovation of Foresters' Hall	Trustees, L. U. District	*Official*	May 13th	ix.
Granite	Reigate U. S. A.	do.	May 14th	ii.
Additions to Residence	Col. J. W. Lemmon	W. Hull	do.	ix.
Paving Works, Sewers, &c.	Finchley Local Board	G. W. Brumell	May 16th	ix.
Smith's Work	Com. of Sewers	*Official*	May 17th	ix.
Reparation and Cleansing of Sewers	do.	do.	do.	ix.
Erection of the Victoria Courts	Birmingham Cor.	do.	do.	ii.
Erection of Cottages, &c.	Admiralty	do.	May 20th	ix.
Main Drainage Works, &c.	Heston, &c., Local Brd.	W. B. Bromley	May 28th	ix.
Erection of Malting, Great Yarmouth	R. S. Watling & Son	W. B. Cockrill	Not stated...	ix.
Church, Stoke-on-Trent	....	Lynman & Rickman	do.	ix.
Alterations and Additions to "Brookleigh."	J. P. Robinson, Esq.	R. T. Elsam	do.	ii.
Painting and other Works, Colchester	War Department	*Official*	do.	ii.
Semi-Detached Villas, Croydon	....	A. Broad	do.	ix.
Enlargement of Board School, new w.c.'s, &c.	Schl. Board for London	*Official*	do.	ix.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Surveyor	Carmarthen Town Cncl.	100*l*., &c.	May 7th	xvi.
Assistant in Borough Surveyor's Office	Southport Town Council	100*l*.	May 10th	xvi.

TENDERS

BEDFORD.—For a new lodge, to be erected at the north entrance of the Bedford Infirmary. Mr. John Day, architect:—

	£	s.	d.
Spencer	£390	0	0
Potter	390	0	0
Harrison	388	0	0
Warton & Walker	385	0	0
Haynes & Son	385	0	0
Freshwater & Son	368	0	0
White	366	0	0
Foster	364	0	0
Todd	341	0	0
Smith	329	7	0

BEDFORD.—For repairing the houses in Mill-street and Castle-hill, Bedford, for the Vicar and Churchwardens of St. Paul's. Mr. John Day, architect, Bedford:—

	£	s.	d.
R. Richards	£418	17	8
Freshwater & Sons	376	14	0
Haynes & Son (accepted)	347	0	0

[All of Bedford.]

BEDFORD.—For a new shop-front, No. 113, High-street, Bedford, for Mr. Walter Blott, draper. Mr. John Day, architect:—

	£	s.	d.
Coleman & Fathers, Bedford	£201	0	0

BRIXTON.—For new organ-chamber, repewing, and new front to gallery, new lavatory, &c., at Trinity Chapel, Church-road, Brixton. Mr. M. V. Treleaven, architect and surveyor, Mordaunt-street, Stockwell:—

	£	s.	d.
Ford & Son	£785	0	0
Crabb & Son	714	0	0
Drury & Son	654	0	0
Read & Son	652	0	0
F. & H. F. Higgs	602	0	0

CROYDON.—For boundary-wall in rear of Birchanger-road Schools, for the Croydon School Board. Mr. Robert Ridge, surveyor:—

	£	s.	d.
Bryan	£126	0	0
Smith & Bulled	122	0	0
Bowyer	118	10	0
Wyatt	114	10	0
Page	114	0	0
Smith & Sons (accepted)	106	0	0

CROYDON.—For alterations at the Spread Eagle, Portland-road, South Norwood, for Mr. Pinn, including new counter and bar fittings. Mr. Robert Ridge, surveyor:—

	£	s.	d.
Lascelles & Co.	£281	0	0
Taylor	250	0	0
Simpson (accepted)	241	0	0

EPSOM.—For the erection of stables, coach-house, &c., for M. Williams, Epsom. Mr. J. H. Harding, architect:—

	£	s.	d.
Shedwick, Epsom	£487	10	0
S. Hards, Ewell	458	10	0
Adams, Sutton	433	0	0
A. Hards, Ewell	430	10	0
Jeal, Epsom	430	0	0
Chevingten, Epsom	365	0	0
Hughes, Aldershot	335	0	0

FINCHLEY.—For alterations and additions to house, Torrington Park, N. Mr, F. D. Thomson, architect, North Finchley:—

	£	s.	d.
Norman & Co.	£822	5	0
Wheeler & Co.	755	0	0
Voller	686	0	0
Woodhall (accepted)	619	0	0

GREENWICH.—For erecting West Greenwich Working Lads' Institute and Ragged School. Mr. George Baines, architect, Great Winchester-street, London:—

	£	s.	d.
Heryet	£2,230	0	0
Atherton & Latta	2,220	0	0
J. T. Holloway	2,169	0	0
W. Johnson	2,048	0	0
S. J. Scott	1,993	0	0
Holliday & Greenwood	1,983	0	0
F. & H. F. Higgs	1,980	0	0
B. E. Nightingale	1,980	0	0
Charles Wall	1,979	0	0
Stimpson & Co.	1,960	0	0
R. G. Battley	1,953	0	0
S. J. Jerrard	1,943	0	0
H. L. Holloway, Union Works, Church-street, Deptford (accepted)	1,785	0	0

[Architect's estimate, 1,920*l*.]

HORNSEY.—For alterations and additions to premises, corner of Hornsey and Fairbridge roads, for the Trustees of the Hornsey-rise Jubilee House. No quantities. Mr. J. D. Mathews, architect:—

	£	s.	d.
Grover & Son	£2,048	0	0
Roberts	1,940	0	0
Williams & Son	1,887	0	0
Spenser	1,620	0	0
R. D. Lown & Sons	1,520	0	0

LEICESTER.—For the construction of about two and three-quarter miles of new main brick and pipe sewers, for the Corporation of Leicester (Contract No. 1, section IV.). Quantities, specification, and drawings by Mr. J. Gordon, M.Inst.C.E., Borough Surveyor:—

	£	s.	d.
C. Braddock, Southport	£21,511	16	2
James Evans, Birmingham	20,641	7	1
Jno. Edmondson, London	19,828	9	5
A. Kellett, London	18,233	7	2
Geen & Parker, Cardiff	17,992	3	5
James & Wood, Handsworth	17,178	10	0
Wm. Meats, Nottingham	17,131	19	6
John Pickthall & Sons, Merthyr Tydvil	16,560	4	6
Geo. Law, Kidderminster	16,164	2	7
J. W. & G, Neave, Leytonstone	15,770	9	1
B. Cooke & Co., Battersea	15,256	15	6
Jno. Hill, Sheffield	14,560	5	6
Enoch Tempest, Leicester	14,436	5	1
Nelson & Co., Cardiff	14,120	0	0
Hy. Hildon, Birmingham	14,115	2	2
Chas. Baker & Sons, Bradford	13,809	1	1
T. Small & Sons, Handsworth	13,335	13	6
S. & E. Bentley, London	12,990	12	8
Reuben Clarke, Sheffield	12,986	19	7
Frank Eyre, Sheffield	12,281	1	11
James Dickson, St. Alban's*	12,187	1	3

* Accepted.

LONDON.—For alterations, &c., at the Railway Tavern, Stepney Station, Commercial-road East, for Mr. W. G. Crow. Mr. H. E. Mountford, Pigott-street, surveyor:—

	£	s.	d.
Salt	£148	0	0
Walker	140	0	0
Lusk (accepted)	129	0	0

LONDON.—For laying with compressed asphalte the following carriageways for the Vestry of St. James's, Westminster, viz., Air-street, Broad-street, Denman-street, Ganton-street, Hopkins-street, King-street, Marshall-street, Ingestre-place, Noel-street, Great Pulteney-street, West-street, and Albany-court-yard:—

	Per sq. yard.	*Per sq. yard.
Brunswick Rock Asphalte Co., 9, Gracechurch-street, E.C.	15s. 0d.	1s. 0d.
Val de Travers Asphalte Co., Palmerston-buildings, E.C.	12 6	1 3
French Asphalte Co., 27, Cornhill, E.C. (accepted)	11 9	1 6
Barber Co.	11 0	0 9
Limmer Asphalte Co., 57, Gracechurch-street, E.C.	9 10	1 3

* Credit for old granite setts.

LONDON.—For pulling down and rebuilding "The Horns" public-house, St. John's-street, Clerkenwell, for Mr. Street. Messrs. Alexander & Gibson, architects, Great James-street, Bedford-row:—

	£	s.	d.
John Beale, Westminster Bridge-road*	£1,830	0	0

* Accepted. [No competition.]

LONDON.—For the enlargement of the Great College-street School (Marylebone), by 406 places, for the School Board for London. Mr. T. J. Bailey, architect:—

	£	s.	d.
A. G. Allard	£10,671	12	6
Gould & Brand	10,193	0	0
Holloway Bros.	9,895	0	0
W. Martin	9,845	0	0
W. Oldrey & Co.	9,470	0	0
W. A. Rhodes	9,337	0	0
W. Johnson	9,253	0	0
Atherton & Latta	9,010	0	0
Wall Bros.	8,987	0	0
H. L. Holloway	8,979	0	0
S. J. Jerrard	8,971	0	0
Stimpson & Co.*	8,900	0	0

* Recommended by the Works Committee for acceptance.

LONDON.—For building new house for the school-keeper of the Wellington-street School (Hackney), for the School Board for London. Mr. T. J. Bailey, architect:—

	£	s.	d.
H. L. Holloway	£570	0	0
Gould & Brand	553	0	0
T. Bendon	510	0	0
G. S. Williams & Son	493	0	0
W Johnson	420	0	0
C. V. Howard	389	0	0
D. Doubleday & Son*	350	0	0

* Recommended for acceptance.

LONDON.—For removal of two iron buildings, on the Cobourg-road site (Lambeth), for the School Board for London. Mr. T. J. Bailey, architect:—

	£	s.	d.
W. Oldrey & Co.	£335	0	0
A. Martin	300	0	0
Riley Bros.	250	0	0
H. L. Holloway	217	0	0
T. Bendon*	215	10	0

* Recommended for acceptance.

LONDON.—For alterations and repairs at 22, Denmark-street, Soho. Mr. A. S. Timothy, architect :—

Brand	£259	0	0
A. B. Clarke	245	0	0
Longard	130	0	0

MILVERTON (near Leamington).—For building Board School and caretaker's house, Milverton, near Leamington :—

Inwood, Malvern	£2,598	0	0
J. Light, Oldbury	2,574	0	0
C. G. Hill, Coventry	2,496	0	0
C. Claridge, Banbury	2,388	0	0
Horsley Bros., Birmingham	2,240	0	0
Espley, Stafford	2,159	0	0
Rowbotham, Birmingham	2,092	0	0
Dorse & Son, Cradley	2,070	14	0
G. F. Smith, Milverton (accepted)	2,060	0	0
Jones & Son, Sedgley	1,995	0	0

NEWPORT (Mon.).—For the erection of new Hotel, now known as "Roller's Arms," Lydn, near Newport. Mr. E. A. Lansdowne, architect. Quantities by the architect :—

A. Oakey, Newport	£2,374	12	0
W. M. Blackburn, Newport	2,355	0	0
T. Webb, Newport	2,206	0	0
D. C. Jones & Co., Gloucester	2,157	0	0
J. Firbank, Newport	2,130	0	0
J. Linton, Newport	2,099	0	0
H. Parfitt, Pontnewydd	2,060	0	0
Executors of W. H. Gradwell, Barrow-in-Furness	1,975	0	0
C. Miles, Newport	1,947	0	0
J. McLean, Lydn	1,911	0	0
T. Goldsworthy, Newport (accepted)	1,847	0	0

SOUTHAMPTON.—For store on the Town Quay, for the Pier and Harbour Board. Mr. J. G. Poole, architect :—

Carden	£1,774	0	8
Franklin	1,526	5	9
Trehearne & Co.	1,410	0	0
Crook & Son	1,270	0	0
Stevens & Sons (accepted)	1,253	0	0
Bull, Sons, & Co.	1,227	0	0

[All of Southampton.]

SOUTHAMPTON.—For additions to lodge at the Cemetery, for the Mayor and Corporation. Mr. W. B. G. Bennett, Borough Surveyor :—

Hornychurch & Mitchelmore	£325	0	0
Franklin	287	0	0
Harvey	279	14	0
Bull, Sons, & Co.	250	0	0
Crook & Sons (accepted)	237	0	0

[All of Southampton.]

STRATFORD.—For new buildings for the Stratford Co-operative Society," Limited, Stratford. Mr. Henry Poston, architect, Lombard-street :—

E. Conder	£6,582	0	0
T. Boyce	6,300	0	0
C. Cox	6,060	0	0
Outhwaite & Son	5,978	0	0
J. Morter, Stratford (accepted)	5,893	0	0

[All exclusive of fittings.]

⁂ **SPECIAL NOTICE.**—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., not later than 12 Noon on THURSDAYS.

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"Arete' (Henry Holland was an architect of considerable note in his day; designed Claremont House for Lord Clive; Carlton House, and the Brighton Pavilion for the Prince of Wales, &c. Gwilt calls him "the chief introducer of the so-called Greco-Roman style." Died in 1806).—"Sewerage" (no wonder you ask to have "*nom de plume* only published"! If you have any clear idea about it in your own mind, you have managed to make a curious muddle of it on paper).—G. H. C.—W. P.—W. S. & Co.—S. T. N.—H. G.—J. G. (book received: shall have attention).—K. H.—S. M.—B. B.

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Addressed to No. 46, Catherine-street, W.C.

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DISCOUNT TO BUILDERS.

Map of London,

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